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OBSTETRIC SHOCK: ITS CAUSES, RECOGNITION AND MANAGEMENT

CHAIRMAN'S ADDRESS

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BROOKLYN

Shock or its equivalent, by whatever name the era in question gave it, has been known since man came on the earth. Primitive men and women, in their struggle for existence, survived or died of shock from injury, trauma, hemorrhage and sickness. Hippocrates undoubtedly gave admonitions about the "bodily ailment" that we know as shock and called attention to the facial expression—the hippocratic facies—observed in those dying of cholera, which is a typical example of medical shock and differs in no wise from surgical shock save in etiology. And similarly, the pathologic lesion of shock and allied states, although not designated by the term "shock" until during the eighteenth century, can be traced down to the present era.

In 1568 William Clowes recognized shock and attributed it "to the presence of a foreign body in the wound or in the blood." John Hunter in 1784 wrote concerning the shock syndrome and its relation to surgery. However, it was not until 1795 that James Latta, writing on surgical shock, actually used the word "shock," as we know it today. Sir Astley Cooper in 1836 published a written report of a number of cases of shock, with pertinent comments on the effect of shock on the nervous system.[1]

In 1870 Golz of Strasbourg performed his classic experiments on the frog, which formed the basis of our modern conception of shock. Since the time of Goltz many research workers, both competent and incompetent, in "good, bad and indifferent" laboratories, have written a voluminous literature on various aspects of shock. In their enthusiasm to solve this perplexing problem, many physiologists and surgeons have published data and drawn conclusions from them which have not stood the test of time and experience and hence have had to be discarded. However, there remains available today a great mass of reliable information on shock, compiled largely since the World War, where, through the cooperation of American, British and French surgeons and physiologists, the real foundation of our present day concepts of the shock syndrome was laid.[2] Yet, with it all, the subject of shock is still in a state of more or less confusion in the minds of most physicians. It is because of this state of affairs and because I hope to arouse or rekindle interest that I have presumed to address this audience on the subject of obstetric shock, realizing full well that I shall add nothing to the sum total of information already available.

At the outset of the discussion which is to follow it would seem in order to have an acceptable definition of shock. Of the many definitions that have been offered, Moon [3] comes nearest to conveying the correct conception of shock. It is as follows: "Shock is a circulatory deficiency, neither cardiac nor vasomotor in origin, characterized by decreased blood volume, decreased cardiac output (reduced volume flow) and by increased concentration of the blood."

Shock can truthfully be considered one of the most confusing syndromes encountered by the clinician in all branches of medicine. This syndrome is recognized to be a group of symptoms and not a disease, and whenever it occurs is a serious and often fatal condition characterized by vasomotor collapse, drop in blood pressure and consequent failure of the circulation. In shock the impairment of the circulation results in a stasis of the blood in the capillaries, transudation of plasma into the tissue spaces, deficient oxygenation of tissues and diminution of blood volume. The heart in shock is well able to perform its function. However, the physical and physiochemical changes will eventually cause impairment because of the extra strain placed on it by its endeavor to overcome the deficient circulation. Weakness of the heart beat is due to reduced inflow from the veins and not to an essential cardiac deficiency.

In spite of the enormous amount of research on the subject of shock, the causes for the disturbance in circulatory function are still unknown. Many theories have been advanced as to the cause of shock, but no uniformity of opinion exists as to its production. The following course of events seems to be accepted by all investigators: The heart is not primarily at fault and the disturbance does not originate in the nervous mechanism controlling it or in the vasomotor system. A marked decrease in the total blood volume and an increase in concentration of the blood have been constant manifestations. The latter feature appears early, is easily detected and hence is useful as a criterion of shock, whether this occurs clinically or is produced experimentally. The substitution of hemoconcentration as a diagnostic aid, instead of changes in blood pressure as a criterion, facilitates the early recognition of shock and permits of a distinction between the effects of narcosis, hemorrhage or injury. The volume output of the heart per minute, or, as is so often stated, the volume flow of arterial blood, is markedly decreased. This feature

Read before the Section on Obstetrics and Gynecology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Crile, George W., and Lower, W. E.: Surgical Shock and the Shockless Operation Through Anociassociation, Philadelphia, W. B. Saunders Company, 1920.

2. Cannon, W. B.: Traumatic Shock, New York, D. Appleton & Company, 1923.

3. Moon, Virgil H.: Shock and Related Capillary Phenomena, New York, Oxford University Press, 1938.

is technically more difficult to demonstrate and, consequently, not so many workers have emphasized it.

Clinicians agree on the signs of shock. They are as follows: Prostration is evident; the patient is profoundly depressed, weak and restless. The pulse is rapid, feeble and of small volume. The extremities are cold and the body temperature is low. The face is drawn, ashen or livid in color, anxious in expression and moist with cold sweat. The eyes are sunken and surrounded by bluish rings, producing the classic "hippocratic facies." Thirst is incessant, but attempts to relieve it are ineffective because of vomiting. The fluid vomited is often in excess of that swallowed and contains small brown flocculi. Perspiration is profuse and diarrhea may be present. The respirations are shallow and interspersed with deep sighs. The blood pressure declines progressively. Urination is scanty or suppressed. Consciousness is retained until finally there is loss of sensitivity, of reponsiveness to stimuli and of reflexes. Unconsciousness or coma precedes death. It should be noted that sometimes a marked and rapid increase in temperature—agonal fever—precedes death.

For the successful treatment of shock, the physician should not wait for the development of this clinical picture. Watchful waiting during this period is disastrous. The time will be short for the systemic deficiency of oxygen to produce irreversible changes in the capillaries, in the myocardium and in the delicate cells of the central nervous system. Treatment, to be effective, must precede the development of the clinical manifestations described. It must anticipate the complicated interplay of the varied group of agencies whose combined efforts culminate in failure of the circulation. This vicious circle with its contributory factors requires time for development. When capillary relaxation begins and the sequence which may lead to shock is initiated, the disturbance is compensated for a time. This is accomplished in part by constriction of the arteries and by the discharge of blood into the circulation from the spleen and other reservoirs. Further compensation is accomplished by restricting the circulation to vital organs. This period of compensated circulation lasts for an indefinite time, during which the total blood volume and volume flow of blood are reduced but adequate blood pressure is maintained. Gradually, as time passes, the compensation fails, the blood pressure drops progressively and the clinical signs become unmistakable. A grave error is made by those who depend entirely on blood pressure as an indicator of the condition of the circulation. A marked decline in pressure never occurs early and often appears in the terminal state. Low blood pressure is not a sign of developing shock but of decompensation. There is abundant clinical and experimental evidence to support these statements.

Those who have studied shock by various means have disagreed on many points, but there is complete agreement that a marked decrease in the total blood volume is a prime factor. For many years the "problem of the lost blood" was the chief enigma of shock. One of the facts established early in the World War by clinical studies on wounded men was that the blood became progressively more and more concentrated as shock developed. But the relationship of hemoconcentration to the lowered blood volume may be due to decrease in volume of corpuscles or of plasma or both. Immediately after a large hemorrhage the blood volume is decreased as a result of the loss of blood cells and plasma. In shock there is a marked decrease in total blood volume. This is due to a decrease in plasma volume because of the transudation of fluid and protein through abnormally permeable capillaries. This results in a state of hemoconcentration, as evidenced by hematocrit values and red blood cell counts. Hemoconcentration furnishes a practical means of differentiating shock from hemorrhage.

Variations in blood volume of practical value in determining the state of the circulation have been found after severe wounds (Keith), but estimations of blood volume are not sufficiently simple for clinical use. Variations in volume flow are equally significant, but these are even more difficult to determine clinically. Hemoconcentration appears early, is regularly present, progresses in a degree paralleling that of the circulatory deficiency and is detectable by simple means—repeated red blood cell counts. It is also recognized by variations either in hematocrit readings or in the specific gravity of the blood, in the hemoglobin content or in the erythrocytic count. The latter is the simplest and most accurate of the four. Marked variations in hematocrit readings may result from swelling of the individual red blood corpuscles when no loss of plasma has occurred by leakage. For this reason the readings may give misleading information. Few physicians are prepared to determine the specific gravity even by the simple method of Hammerschlag. The variations in specific gravity do not occur in so wide a range as those of the erythrocyte counts. For example, the former may range between 1.050 and 1.070, while counts on the same blood would show an increase from 4,800,000 to 9,000,000 red blood cells.

On theoretical grounds the hemoglobin content should run parallel with the red blood cell count and should be equally accurate. Practically there are fluctuations in the hemoglobin readings by which they vary from the counts of erythrocytes made on the same samples of blood. Why these variations occur and whether they are related to the anoxemia present in shock is not known. The progressive increase in the number of red blood cells presents a curve which has fewer irregularities than that of the hemoglobin content. Hemoconcentration invariably develops before the blood pressure declines.

Other clinical signs may be noted during the early stages of shock. Eppinger emphasized the empty, flaccid condition of the superficial veins. Several authors have recorded that it is difficult sometimes to secure blood by venipuncture. The skin and subcutaneous tissues lose their normal tonus and become flaccid or doughy in consistency. The skin becomes pale and does not bleed when punctured. The pulse may be normal in rate but low in volume. This change in quality is readily detected by an experienced clinician. It indicates a decrease in the volume flow and occurs before the arterial pressure is reduced. All these signs indicate a reduced volume flow of blood and they occur while the mechanism of compensation is still effective. The presence of these signs combined with a hemoconcentration of 25 per cent or more is ominous. If the deficiency progresses, decompensation occurs rapidly and an unremitting decline in blood pressure is imminent.

Comparison of blood pressure and hemoconcentration curves in cases of imminent circulatory failure reveals a strikingly early appearance of hemoconcentration and a relatively late decline in blood pressure. It is evident, therefore, that hemoconcentration is the earliest detectable sign of shock and can be determined by any physician capable of doing red blood cell counts.

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OBSTETRIC SHOCK

"Shock is shock," and that occurring in obstetrics, so far as can be determined, is no different from surgical, medical or experimental shock. Furthermore, its recognition and treatment present the same identical problem as other types of shock. In recent years there has appeared, particularly among the French and German observers, the idea that the mechanism of the production of obstetric shock is different from other varieties of shock; but the preponderance of evidence is still against such a view.

Besides the changes which take place in the pelvic structures as a result of pregnancy, there are changes in the blood circulation, respiratory system, urinary tract, alimentary tract, osseous system, ductless glands and metabolism. For practical considerations, in the mechanism of the production of obstetric shock it is desirable to possess an accurate knowledge of the physiologic changes of pregnancy. These changes may predispose to shock and shocklike conditions in the presence of moderate hemorrhage, trauma, anesthesia and infection. For obvious reasons, I could not include in this discussion the physiology of pregnancy. However, its importance must again be emphasized.

It is apparent that, from the physiologic changes coincident with pregnancy, the parturient is a poor surgical risk, since even moderate hemorrhage, trauma, anesthesia or infection may produce shock. Further, the hypersensitive nervous system predisposes the patient to reflex shock. Prolonged labor with associated dehydration and acidosis are factors resulting in toxic shock. The hypersensibility of pituitary extract of the expectant mother is another etiologic factor. The toxemias of pregnancy, with unrecognized or demonstrable liver damage, are predisposing factors and often lead to fatalities which can be explained only at necropsy. Since the uterine veins have no valves and the placental site contains numerous blood sinuses, thrombosis and embolism are not uncommon, especially after prolonged labor with a poorly contracting uterus. Unrecognized cardiac lesions, thyroid disease, tuberculosis and adrenal cortical insufficiency may, after prolonged labor, suddenly present a shocklike picture.

Obstetric trauma, as a rule, is associated with moderate hemorrhage. Shock is characterized by paralysis of the splanchnic vasomotor system with venous stasis in the abdominal cavity. When shock is associated with hemorrhage, the severity of the symptoms is out of all proportion to the severity of the hemorrhage, which may be relative. Hemorrhage does not, per se, induce shock, but the combination of hemorrhage and trauma may produce shock when neither the hemorrhage alone nor the trauma alone would have this effect.

Acute traumatic lesions, like ruptured uterus or extensive lacerations of the cervix, with moderate or profuse hemorrhage, following instrumental or spontaneous delivery, are always productive of shock. Obstetric hemorrhages are always alarming, and in most cases the clinical picture is evident and the diagnosis is readily made.

TREATMENT

The best treatment for shock is prevention. All hemorrhage should, of course, be promptly controlled. The probable or possible development of shock can be anticipated by any physician who is conversant with the various conditions which may cause it. At times it may be possible to obviate the cause; otherwise measures should be directed toward preventing or minimizing any degree of circulatory inefficiency. Any therapeutic agent available for use as a preventive measure is worthy of serious consideration. Dextrose is such an agent and has been spoken of as the "universal therapeutic agent," for it has many and varied uses in general medicine, surgery, pediatrics and obstetrics and gynecology. In obstetrics, however, it is especially valuable because, as the physiologists tell us, among other important therapeutic properties it is a food for all the vital organs, particularly the liver and the heart muscle; it requires no digestive processes to prepare it for absorption; being a monosaccharide, it is spontaneously and completely metabolized to carbon dioxide and water; it promotes diuresis and combats acidosis, and it temporarily raises the systolic blood pressure and improves the quality and reduces the rate of the pulse. It follows, therefore, that dextrose may be used equally well prophylactically to prevent shock or therapeutically during shock.

Prolonged labor produces muscle fatigue, which is shown by the gradual increase in pulse rate, slowing of uterine contractions, tendency of the tongue to become dry, intestinal distention, and usually some rise in temperature. The tired parturient patient is a poor operative risk. Furthermore, anesthesia upsets the balance between the constituents of the protein radical, which has already been disturbed by the pregnancy. In such cases a dose of morphine secures both physical and uterine rest, and an intravenous injection of from 100 to 200 cc. of a 50 per cent dextrose solution will completely change the patient's appearance, as the pulse is slowed and both the systolic and pulse pressures are improved. If fluid is needed, 75 Gm. of dextrose in 500 cc. of saline solution may be given from 3 to 5 cc. per minute.

The effects of general anesthesia as contributory to shock are well known. Severe physical injury may be sustained without apparent evidence of circulatory deficiency; but with anesthesia, or during an operation, shock may develop. A similar effect may result from disease which has reduced the patient's reserve of physiologic resources. Surgeons widely hesitate to subject a patient who is a "poor surgical risk" to general anesthesia and extensive operative procedures. Experience indicates that nitrous oxide anesthesia is less likely to precipitate shock than either ether or chloroform. Local infiltration anesthesia is the safest and has been extensively employed with much success in operative obstetrics.

Recently the barbiturates have been advocated as more satisfactory than ether, and they have been widely advertised as minimizing the danger of shock in obstetric cases. Such claims must be viewed conservatively. The use of the barbiturates as anesthesia during the production of shock experimentally indicates, in the dosage used, that they contribute greatly to its development. The occasional reports in articles on surgical and obstetric practice of untoward results under barbiturate anesthesia confirm the opinion that these compounds are not free from danger.

Prophylaxis, therefore, is a bulwark against shock or conditions leading to shock, that every physician doing obstetrics should appreciate more keenly than has hitherto been done; for no pathologic lesion in obstetrics more accurately dovetails in with the old adage that "An ounce of prevention is worth a pound of cure" than that of shock.

For many years physicians have noted the weak pulse, low blood pressure and other evidences of failing circulation in shock. Long ago it was demonstrated that this

deficiency is not of cardiac origin, and that fact has been verified repeatedly, both clinically and experimentally. Notwithstanding this knowledge, many still attempt to secure slower, stronger pulse and improved heart action by digitalization of patients who are shocked and moribund. Such attempts show a simple childlike faith in the omnipotence of drugs. Equally illogical is the attempted treatment of shock with vasoconstrictor drugs such as epinephrine. Apparently, some have not sensed that in shock the arteries are not relaxed but are markedly contracted. But the reasoning is simple: these patients have low blood pressure, epinephrine increases the blood pressure in normal subjects, therefore give epinephrine. Not only is this agent useless; it has grave potentialities if given in excess of physiologic doses. Shock can be produced in normal animals by the prolonged effects of epinephrine. The use of such drugs as digitalis and epinephrine in cases of shock might not be censured so severely if occasional success resulted. But one searches in vain for published reports of beneficial effects from the use of these drugs in shock.

Evidence has been presented indicating that adrenal cortical extract, given by injection, aids in preventing shock. It is probable that in some apparently normal persons the adrenal cortical function is slightly below normal. Perhaps those who are hypersensitive to injuries, infections and drugs belong to this group. If so, it is possible that the substance of adrenal cortex supplied artificially might tend to prevent the development of shock when these persons are passing through emergencies.

The use of pitressin has been suggested because of its effects in producing contraction of the capillaries. It is recalled that Krogh's experiments indicated that a hormone of pituitary origin is a physiologic agent causing contraction of the capillaries. On theoretical grounds such a substance might be useful in restoring normal tonus to capillary endothelium which has become relaxed, provided the endothelium has retained its capacity to respond to such stimuli. In many instances it fails to accomplish this end.

Morphine, in sufficient dosage, should be used in shock to relieve pain and allay restlessness. If bleeding is or has recently been present, it should be given to quiet the circulation. When marked cyanosis is present, some sedative other than morphine, for obvious reasons, is indicated.

Many writers have advocated the use of caffeine, and a few believe that strychnine is beneficial. It is uncertain whether these suggestions are based on sound experience or on theory. It has not been shown that either of these agents influences capillary tonus directly. Under conditions of warfare, hot coffee and tea were used with benefit in preparing men suffering from wounds, cold and exhaustion for operation. It is believed that this is the logical use of stimulants. One would not expect them to produce lasting improvement in the failing circulation of shock.

Various mechanical means for aiding the return of venous blood have been employed. The most common of these is the Trendelenburg position. Other efforts advised consist in mechanical pressure applied to the limbs, such as an elastic binder, and sand bags to the abdomen. These suggestions recognize the factor of low venous pressure and they attempt to raise it by external pressure. The reasoning on which such suggestions are based is not entirely sound and does not take into account the fact that blood is not pooled in the veins but in the capillaries. The effect of gravity, when the body is in the Trendelenburg position, favors recovery from "primary shock" or syncope but is of very doubtful value in late shock. Blood sequestered by stasis in the visceral capillaries is not readily affected either by gravity or by external pressure. Furthermore, a very important feature is stasis of blood in the pulmonary circulation. This cannot be beneficially affected by these methods either. Sand bags to the abdomen have the disadvantage of hindering respiration. Any condition that limits respiratory activity lessens the delivery of oxygen and accelerates the development of shock. Mechanical aids to combat the effects of low venous pressure are therefore of doubtful value.

Heat should be employed externally in every case of shock in an effort to improve peripheral circulation. No patient in shock can be successfully treated unless body temperature can be raised to within normal or nearly normal levels. Excessive heat, on the other hand, is contraindicated because it causes a loss of water and chlorides as the result of sweating.

Loss of blood volume and the disparity between it and the volume capacity of the vascular system are basic factors in the mechanism of shock. The restoration of blood volume is a most logical and beneficial measure. When the permeability of the capillaries has not been increased, the loss of fluid may be made up and the circulatory efficiency restored by introducing saline solution. Low blood volume due to hemorrhage may be effectively restored by this means alone, provided the total hemoglobin has not been reduced below one third of that normally present. In dealing with shock and hemorrhage, Keith found that patients fell into one of three groups, according to their response to fluids introduced into the vascular system:

1. Those whose blood volume had been moderately reduced but whose vascular systems could both absorb and retain fluid. These would recover spontaneously if given fluid by mouth or otherwise.

2. Those with more serious loss of blood volume and with marked loss of plasma (hemoconcentration), whose vascular systems had lost the ability to absorb fluid but would still retain it if supplied in suitable form. Treatment of these, by infusion of gum-saline solution or by transfusion of blood was effective. They were spoken of as partially decompensated cases.

3. Those with marked loss of plasma volume, whose vascular systems would neither absorb nor retain fluid. The blood pressure in this group had already been below the critical level (80/40) for some time. No form of treatment was effective in these decompensated cases.

From extensive laboratory and clinical research, it is known that the ideal intravenous solution in the treatment of shock and its allied conditions should act: (1) to increase blood volume in the cardiovascular system without overloading the heart; (2) to provide easily accessible nourishment for the tired out myocardium and liver, i.e., replacement of glycogen in these organs; (3) to help restore the circulation in general, and (4) to tide the patient over the critical period of shock, dehydration and acidosis, profound toxemias and critical infections until transfusion and other suitable therapeutic measures can be instituted. Furthermore, it would seem that the intravenous addition of large quantities of fluid of any nature, except blood perhaps, is inadvisable and often actually dangerous, for it might well mean the addition of an insurmountable load on an already impaired circulation and weakened myocardium, which might result in cardiac dilatation and failure.

The ideal method of treatment is to introduce some fluid into the blood stream that will cause an increase both in blood volume and in blood pressure. To accomplish this result, blood and its substitutes have been successfully employed. Whole blood is the ideal therapeutic agent for increasing the blood volume and blood pressure. It is universally agreed, therefore, that the best method of treating shock due to hemorrhage is by transfusion of whole blood. When whole blood is used, there is a dilution of red blood cells in the blood stream due to the passage of fluid from the tissue spaces back into the blood vessels. Whole blood, therefore, will increase blood volume, although, when injected intravenously in the presence of circulatory stasis, protein is lost through the capillary walls. This, however, is at least partially compensated for, as a large amount of additional protein is being put into the circulation by the intravenous injection of blood.

As an emergency measure, in the absence of blood or because of delay in obtaining the proper donor, it is usually necessary to use a substitute for blood in order to tide the patient over this critical waiting period. The results following the use of most of the substitutes have not been very encouraging. Isotonic saline solution has been shown to be of little practical value. It will temporarily cause an increase in blood pressure, but, as the fluid injected passes into the tissue spaces, the blood pressure will in a very short time be as low as before and usually lower. Besides, with the injection of physiologic solution of sodium chloride there is a decrease in the total amount of plasma and at the same time a decrease in the percentage of protein in a unit volume of plasma. Therefore, isotonic saline solution will not cause an increase in the volume of blood in circulation because, with the diminished osmotic pressure, a decreased quantity of fluid is attracted back into the blood vessels from the tissue spaces. Weak solutions of dextrose have proved to be no more efficient. Solutions of acacia and of acacia with dextrose have their adherents. Acacia was added to saline solution in order to supply a colloid substance which would be retained by damaged endothelium. Later, acacia (6 per cent) was added to hypertonic dextrose solution and this method was successful in temporarily combating shock until transfusion could be given. Other agents that have been used are 2.5 per cent gelatin, human ascitic fluid and preserved human blood plasma.

Fearing the use of large quantities of fluid intravenously in "shocked cases," my associates and I have used in our clinic from 50 to 200 cc. of a 50 per cent solution of dextrose (usually 100 cc.) with excellent results. In cases in which acute shock was not the primary indication for the use of dextrose, 300 cc. of a 25 per cent solution in saline solution has been employed. Some patients have received these injections of dextrose before and after operation and during labor merely as a prophylactic measure, while others have received them for postoperative and postpartum complications. Hypodermoclysis of physiologic solution of sodium chloride is usually given immediately following the intravenous dextrose in sufficient quantity to supply the required fluid (water); i.e., from 2,000 to 5,000 cc. in twenty-four hours.

In cases of acute antepartum hemorrhage (ablatio placentae, placenta praevia), abortion, postpartum hemorrhage and tragic ectopic gestation, the introduction of 100 cc. of a 50 per cent solution of dextrose will raise the blood pressure from 20 to 50 mm. of mercury within a period of five to ten minutes. This rise is maintained from twenty to forty-five minutes, which gives sufficient time to prepare for transfusion.

Anoxia in the blood and tissues is a factor of the utmost gravity in the operation of the vicious circle of shock. Oxygen by inhalation is indicated and should be employed, I believe, in conjunction with other means more often than it is by most obstetricians. It helps to counteract anoxia before the circulatory deficiency becomes irreversible. This should be done early if benefit is to be expected. The use of oxygen after the blood pressure has declined seriously and the patient is obviously in a critical state will be as futile as its use in the terminal stage of pneumonia.

SUMMARY

Obstetric shock is no different from other types of shock, but the obstetric patient is more susceptible to shock, as a result of mild trauma, hemorrhage and infection, because of the physiologic changes coincident with pregnancy, labor and the postpartum period.

Until better measures are found, efforts to prevent or combat shock must continue along the following primary principles:

A thorough comprehension of the conditions which may lead to shock, and their prevention when possible.

A knowledge of the physiologic changes of pregnancy which predispose the parturient as a poor risk for operative procedures.

The recognition of circulatory deficiency before it is fully developed. Hemoconcentration provides the criterion and repeated red blood cell counts substantiate the evidence.

Efforts to counteract diminished blood volume should be employed before it is too late. Fluids by whatever route should be given. Transfusions should be given early. In the acute hemorrhages in obstetrics, from 500 to 2,000 cc. of blood may be required. In toxic or reflex shock, intravenous administration of hypertonic dextrose solution and salt solution should be given early, blood transfusion only if necessary.

Efforts should be employed to counteract anoxia by the artificial administration of oxygen.

The use of stimulating drugs is of very questionable value.

The use of adrenal cortex extract may be of value as a preventive. This is of unquestionable value when cortical function is known to be deficient.

Active treatment for shock should be instituted early, before complete circulatory collapse results.

In conclusion, I should like to leave this thought: Real progress in the prevention, recognition and management of shock lies not only in cultivating the art of obstetrics but in the study of the biologic principles that concern reproduction, function, nutrition, metabolism and the repair of tissues and in the thoughtful application of this knowledge. With the mastery of these principles, clinical experience and the maturity of years will give that degree of sound judgment which every physician doing obstetrics—general practitioner or specialist—longs to attain.

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Practical and Scientific Medicine. — The divergences between practical and scientific medicine, and especially between their manner of thought and standard of accuracy, are in actual fact profound and far-reaching. They are perhaps as profound as, they are certainly not dissimilar to, those exhibited in the past between orthodox religion and science.—Lewis, Sir Thomas: Research in Medicine and Other Addresses, London, H. K. Lewis & Co., Ltd., 1939.

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3. Those with marked loss of plasma volume, whose vascular systems would neither absorb nor retain fluid. The blood pressure in this group had already been below the critical level (80/40) for some time. No form of treatment was effective in these decompensated cases.

From extensive laboratory and clinical research, it is known that the ideal intravenous solution in the treatment of shock and its allied conditions should act: (1) to increase blood volume in the cardiovascular system without overloading the heart; (2) to provide easily accessible nourishment for the tired out myocardium and liver, i.e., replacement of glycogen in these organs; (3) to help restore the circulation in general, and (4) to tide the patient over the critical period of shock, dehydration and acidosis, profound toxemias and critical infections until transfusion and other suitable therapeutic measures can be instituted. Furthermore, it would seem that the intravenous addition of large quantities of fluid of any nature, except blood perhaps, is inadvisable and often actually dangerous, for it might well mean the addition of an insurmountable load on an already impaired circulation and weakened myocardium, which might result in cardiac dilatation and failure.

The ideal method of treatment is to introduce some fluid into the blood stream that will cause an increase both in blood volume and in blood pressure. To accomplish this result, blood and its substitutes have been successfully employed. Whole blood is the ideal therapeutic agent for increasing the blood volume and blood pressure. It is universally agreed, therefore, that the best method of treating shock due to hemorrhage is by transfusion of whole blood. When whole blood is used, there is a dilution of red blood cells in the blood stream due to the passage of fluid from the tissue spaces back into the blood vessels. Whole blood, therefore, will increase blood volume, although, when injected intravenously in the presence of circulatory stasis, protein is lost through the capillary walls. This, however, is at least partially compensated for, as a large amount of additional protein is being put into the circulation by the intravenous injection of blood.

As an emergency measure, in the absence of blood or because of delay in obtaining the proper donor, it is usually necessary to use a substitute for blood in order to tide the patient over this critical waiting period. The results following the use of most of the substitutes have not been very encouraging. Isotonic saline solution has been shown to be of little practical value. It will temporarily cause an increase in blood pressure, but, as the fluid injected passes into the tissue spaces, the blood pressure will in a very short time be as low as before and usually lower. Besides, with the injection of physiologic solution of sodium chloride there is a decrease in the total amount of plasma and at the same time a decrease in the percentage of protein in a unit volume of plasma. Therefore, isotonic saline solution will not cause an increase in the volume of blood in circulation because, with the diminished osmotic pressure, a decreased quantity of fluid is attracted back into the blood vessels from the tissue spaces. Weak solutions of dextrose have proved to be no more efficient. Solutions of acacia and of acacia with dextrose have their adherents. Acacia was added to saline solution in order to supply a colloid substance which would be retained by damaged endothelium. Later, acacia (6 per cent) was added to hypertonic dextrose solution and this method was successful in temporarily combating shock until transfusion could be given. Other agents that have been used are 2.5 per cent gelatin, human ascitic fluid and preserved human blood plasma.

Fearing the use of large quantities of fluid intravenously in "shocked cases," my associates and I have used in our clinic from 50 to 200 cc. of a 50 per cent solution of dextrose (usually 100 cc.) with excellent results. In cases in which acute shock was not the primary indication for the use of dextrose, 300 cc. of a 25 per cent solution in saline solution has been employed. Some patients have received these injections of dextrose before and after operation and during labor merely as a prophylactic measure, while others have received them for postoperative and postpartum complications. Hypodermoclysis of physiologic solution of sodium chloride is usually given immediately following the intravenous dextrose in sufficient quantity to supply the required fluid (water); i.e., from 2,000 to 5,000 cc. in twenty-four hours.

In cases of acute antepartum hemorrhage (ablatio placentae, placenta praevia), abortion, postpartum hemorrhage and tragic ectopic gestation, the introduction of 100 cc. of a 50 per cent solution of dextrose will raise the blood pressure from 20 to 50 mm. of mercury within a period of five to ten minutes. This rise is maintained from twenty to forty-five minutes, which gives sufficient time to prepare for transfusion.

Anoxia in the blood and tissues is a factor of the utmost gravity in the operation of the vicious circle of shock. Oxygen by inhalation is indicated and should be employed, I believe, in conjunction with other means more often than it is by most obstetricians. It helps to counteract anoxia before the circulatory deficiency becomes irreversible. This should be done early if benefit is to be expected. The use of oxygen after the blood pressure has declined seriously and the patient is obviously in a critical state will be as futile as its use in the terminal stage of pneumonia.

SUMMARY

Obstetric shock is no different from other types of shock, but the obstetric patient is more susceptible to shock, as a result of mild trauma, hemorrhage and infection, because of the physiologic changes coincident with pregnancy, labor and the postpartum period.

Until better measures are found, efforts to prevent or combat shock must continue along the following primary principles:

A thorough comprehension of the conditions which may lead to shock, and their prevention when possible.

A knowledge of the physiologic changes of pregnancy which predispose the parturient as a poor risk for operative procedures.

The recognition of circulatory deficiency before it is fully developed. Hemoconcentration provides the criterion and repeated red blood cell counts substantiate the evidence.

Efforts to counteract diminished blood volume should be employed before it is too late. Fluids by whatever route should be given. Transfusions should be given early. In the acute hemorrhages in obstetrics, from 500 to 2,000 cc. of blood may be required. In toxic or reflex shock, intravenous administration of hypertonic dextrose solution and salt solution should be given early, blood transfusion only if necessary.

Efforts should be employed to counteract anoxia by the artificial administration of oxygen.

The use of stimulating drugs is of very questionable value.

The use of adrenal cortex extract may be of value as a preventive. This is of unquestionable value when cortical function is known to be deficient.

Active treatment for shock should be instituted early, before complete circulatory collapse results.

In conclusion, I should like to leave this thought: Real progress in the prevention, recognition and management of shock lies not only in cultivating the art of obstetrics but in the study of the biologic principles that concern reproduction, function, nutrition, metabolism and the repair of tissues and in the thoughtful application of this knowledge. With the mastery of these principles, clinical experience and the maturity of years will give that degree of sound judgment which every physician doing obstetrics—general practitioner or specialist—longs to attain.

643 St. Marks Avenue.

Practical and Scientific Medicine.—The divergences between practical and scientific medicine, and especially between their manner of thought and standard of accuracy, are in actual fact profound and far-reaching. They are perhaps as profound as, they are certainly not dissimilar to, those exhibited in the past between orthodox religion and science.—Lewis, Sir Thomas: Research in Medicine and Other Addresses, London, H. K. Lewis & Co., Ltd., 1939.

THE IMPORTANCE OF CANCER AS A CAUSE OF CHRONIC DYSPEPSIA

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Dyspepsia is one of the most frequent causes of man's unhappiness. Dispensers of nostrums, well aware of this fact, are growing rich from the sale of injudiciously recommended medications which allegedly return such sufferers surely and promptly to gastronomic happiness. Persons with chronic dyspepsia who inadvertently persist in self treatment or who continue to apply therapeutic measures advised by nonprofessional medicine venders, despite continuation of symptoms, may be carrying on a dangerous experiment. Not infrequently, such patients are eventually found to harbor diseases which could have been cured if diagnosed earlier. Failure to recognize gallstones or peptic ulcer as the cause of a patient's complaint is a lamentable error; failure to detect the presence of a cancer is fatal to the life of the person who harbors such a lesion. There are some instances in which mistaken diagnoses, although prolonging the patient's suffering, do not seriously jeopardize life. Not so if the offending disease happens to be cancer. Cancer is a relentless invader which persists in its destructive march until it has destroyed the life of its host. To be dealt with successfully it must be detected and destroyed. The earlier it is discovered, the better the chance, as a rule, of the patient's survival.

The object of the study reported in this paper was to gather some information relative to the frequency with which cancer is found to be the cause of indigestion.

MATERIAL FOR STUDY

The total number of cases included in this investigation is 4,656. These were taken in consecutive order from the files of the clinic, the sole criterion for this selection being that these patients included indigestion among their complaints. The diagnoses in these instances were reached after careful clinical and laboratory investigations had been made. These usually included roentgenologic investigations of the gastrointestinal tract or of the gallbladder. In a number of instances the diagnoses were corroborated at operation and in some at necropsy. On the assumption that the relative frequency with which cancer causes indigestion must vary considerably at different ages, the series of cases was then divided into three age groups, which were studied separately. The first consisted of patients from 15 to 24 years of age, the second patients from 25 to 39 years of age, and the third patients 40 years of age and older. When it became evident that cancer was the cause of indigestion among a surprisingly large number of patients in the oldest age group, it became obvious that satisfactory scrutiny would require more accurate study.

Accordingly, the group of patients 40 years of age and older was subdivided into groups comprising periods of five years each, according to ages 40 to 44, 45 to 49 and so on. When this subdivision was made it was found that the number of patients in the older age groups was too small for drawing accurate conclusions. Thus, these lists were augmented to numbers which seemed adequate simply by adding more histories of patients who complained primarily of dyspepsia, taken from the files in consecutive order. Of these patients, 2,448 came to the clinic primarily because of indigestion. There were 2,208 patients who presented themselves for examination for other causes, including indigestion as one of their minor difficulties. The incidence of cancer in this group was ascertained. It was found that, even among those patients who considered their indigestion of secondary importance, cancer was found to be the cause of their digestive disturbances in 2 per cent of cases.

The following statistical studies are the result of closer investigation of the incidence of cancer among the patients who considered chronic indigestion their major symptom and who came to the clinic because of this complaint.

CANCER AS THE CAUSE OF DYSPEPSIA AMONG PATIENTS BETWEEN THE AGES OF FIFTEEN AND TWENTY-FOUR YEARS

A review of the literature might tend to produce an erroneous impression relative to the frequency with which cancer causes indigestion among young persons. Isolated reports of cases focus attention on the unusual case, frequently leaving impressions which are not correct. Careful review of the histories of patients included in this group disclosed the fact that cancer was the cause of indigestion between the ages of 15 and 24 years in only 0.7 per cent of instances. Although, admittedly, cancer of the stomach occasionally occurs in persons who as yet have not reached the age of 25 years, our total series of 4,656 patients who complained of dyspepsia did not include one such instance. Among the young men of this group there was one instance of cancer of the sigmoid and one of cancer of the testicle with metastasis to abdominal organs. The presenting complaint in both of these cases was chronic dyspepsia.

CANCER AS THE CAUSE OF DYSPEPSIA AMONG PATIENTS BETWEEN THE AGES OF TWENTY-FIVE AND THIRTY-NINE YEARS

Although still relatively uncommon among patients of the age group 25-39, cancer begins to have a role of some importance among the causes of indigestion. In 2.7 per cent of these cases it was assumed that cancer was responsible for indigestion. Among the men included in this group it was discovered that 3.5 per cent were suffering from cancer. The lesion most frequently found was cancer of the stomach. Next in numerical importance was carcinoma of the colon. Included in this group there was one case of carcinoma of the prostate gland with metastasis, one of abdominal carcinomatosis in which the site of the primary lesion was not determined, and one of carcinoma of the testis with metastasis. In all of these instances the primary reason for their examination was indigestion.

That cancer of the stomach must be a rather rare disease among women less than 40 years of age is suggested by the fact that there was no instance of cancer of the stomach among 436 women in this age group. Among the causes of indigestion which brought the women of this age group to the clinic for examination there was one instance of cancer of the colon, one of retroperitoneal cancer, one of pelvic cancer with metastasis and one of abdominal carcinomatosis.

From the Division of Medicine, the Mayo Clinic.
Read before the Section on Gastro-Enterology and Proctology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

CANCER AS A CAUSE OF DYSPEPSIA AMONG PATIENTS FORTY YEARS OF AGE AND OLDER

In chart 1 is indicated by an incidence curve the frequency of cancer among 2,448 patients 15 years of age and older, all of whom had presented themselves at the clinic for diagnosis or treatment because of chronic dyspepsia. Patients who are 40 years of age or older are arranged according to periods of five years. It is interesting to note that among the patients included in this series indigestion was caused by carcinoma more than twice as frequently among patients in the late forties as among those in the early forties. For the next five years there was then but little relative increase in the incidence of cancer as the cause of dyspepsia among these patients. In the late fifties 12 per cent of these patients were found to have cancer. The relative frequency of cancer as the cause of indigestion among patients 60 years of age or older readily becomes apparent when one considers that, from the age of 60 to 64 years 21.5 per cent, and from the age of 65 to 69 years, 31 per cent were found to be suffering with this disease. To assume that an elderly patient of 70 years or older who complains of repeatedly recurring dyspepsia is suffering from some unimportant condition is hazardous in the extreme. In 44 per cent of such patients the presence of cancer was demonstrated.

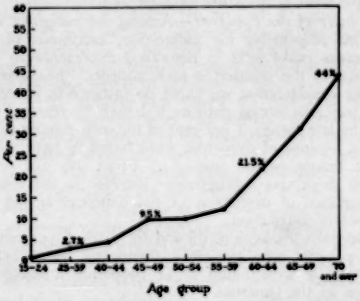

Chart 1.—Incidence of cancer as a cause of indigestion according to age.

After noting the surprisingly high incidence of cancer in this age group it was thought important to know whether men and women who presented themselves complaining of chronic indigestion were equally likely to harbor malignant disease.

CANCER AS A CAUSE OF INDIGESTION AMONG WOMEN FORTY YEARS OF AGE AND OLDER

In chart 2 is illustrated the incidence of carcinoma as the cause of indigestion among 638 women, arranged according to age in groups of five years each, beginning at the age of 40 years. Additionally, in each column will be found the site of the malignant lesions responsible for dyspepsia in the respective age group.

In evaluating the cause of dyspepsia in a large series of cases it will be found that cancer is the cause of such symptoms with much more frequency among males than among females. This is not true, however, in this series among patients between the ages of 40 and 44 years. Women of this age group whose salient complaint was of indigestion were found to have cancer slightly more frequently than were the men of this age group. Between 45 and 49 years of age 7.9 per cent of women who complained primarily of recurring indigestion were found to have cancer. Interestingly, the incidence of cancer as the cause of indigestion among the women included in this series diminished in frequency from the age of 45 years to the age of 65 years; from 45 to 49 years it was 7.9 per cent, from 50 to 54 years 6.8 per cent, from 55 to 59 years 5 per cent, and from 60 to 64 years 4 per cent. After the age of 64 years, however, there was a sharp rise in the importance of cancer as a cause of indigestion among these women. Cancer was found to be the cause of such complaints four times as frequently among women who were in their late sixties as among the women in their early sixties. Among women 70 years of age and older who had come to the clinic primarily because of indigestion, cancer was assumed to be the cause of their difficulties in 30 per cent of cases.

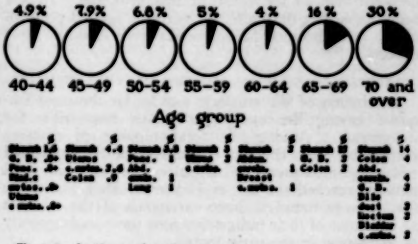

Chart 2.—Incidence of cancer as a primary cause of indigestion in females according to age and site of lesion.

CANCER AS A CAUSE OF INDIGESTION AMONG MEN FORTY YEARS OF AGE AND OLDER

Chart 3 deals with the incidence of carcinoma as the cause of indigestion among 844 men arranged according to age in groups of five years each, beginning with patients aged 40 years. Additionally, in each column is indicated the site of the malignant lesion responsible for dyspepsias in that age group. The relative frequency of cancer as the cause of indigestion among men in their early forties was not surprisingly high. In this group 3.8 per cent of the men who had presented themselves for examination primarily because of chronic dyspepsia were found to have cancer; between the ages of 45 and 49 years 10 per cent, between 50 and 55 years 11.7 per cent, and between 55 and 59 years 17.9 per cent of males with primary complaints of indigestion

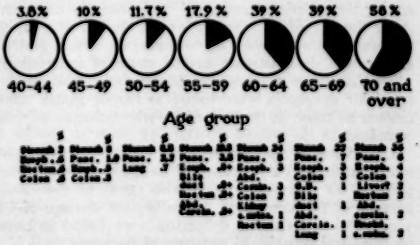

Chart 3.—Incidence of cancer as a primary cause of indigestion in males according to age and site of lesion.

were demonstrated to have cancer which was assumed to cause their symptoms. The seriousness of persisting indigestion among men between the ages 60 and 70 years is demonstrated by the fact that, in 39 per cent of males of this age group whose dyspepsia was serious enough to send them to the clinic for relief, cancer was demonstrated as the cause of this symptom. It is a remarkable fact that, after 70 years of age, 58 per cent of the men included in this series were found to have cancer.

DYSPEPSIA CAUSED BY CANCER OF THE STOMACH

Carcinoma of the stomach was by far the most frequent among the malignant lesions responsible for indigestion. Among the total number of diseases responsible for chronic dyspepsia, cancer remained relatively infrequent as a cause of dyspepsia until patients reached the age of 45 years. Men in the late forties were found to have carcinoma of the stomach as the cause of their indigestion four times as frequently as were men in the early forties.

It is interesting to note that, for a fifteen year age period beginning at the age of 45 years the frequency of cancer of the stomach as the cause of indigestion

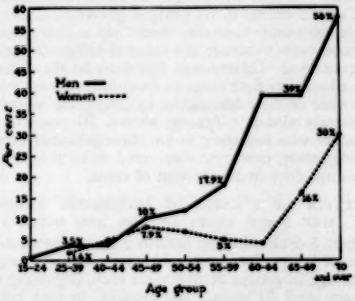

Chart 4.—Incidence of cancer as a cause of indigestion according to sex and age. Indigestion was the primary complaint in this group.

among these patients remained comparatively constant. After the age of 60 years, however, there was a rapid increase in the number of instances in which gastric cancer was demonstrable as the cause of indigestion. More than twice as many men in the sixties who sought relief for dyspepsia were found to harbor gastric carcinoma as those in the late fifties who volunteered this complaint.

Carcinoma of the stomach was by far the most frequent among all the causes of indigestion among the men of 60 years and older who came to the clinic because of this complaint. Men beyond the age of 69 years who had chronic dyspepsia were found to have gastric carcinoma in 36 per cent of instances.

A study of the incidence of cancer of the stomach among women who complained of indigestion is of some interest. Throughout this series, cancer is less commonly the cause of indigestion among women than among males. Among men, carcinoma of the stomach gradually became of relatively greater importance among the causes of indigestion in the older age group, whereas it was noted in this series that, from 45 to 65 years of age there was a gradual diminution in gastric carcinoma as the cause of indigestion among the women. Actually, carcinoma of the stomach was demonstrable as the cause of chronic indigestion in only 2 per cent of women between the ages of 60 and 65 years. Among men of the same age group, gastric carcinoma was responsible for indigestion just twelve times as frequently.

It seemed of some importance that the women in this series who had reached the age of 65 years were six times as likely to have cancer as were women in the early sixties. Women 70 years of age and older who complained primarily of indigestion were found to have cancer of the stomach in 14 per cent of instances.

Cancer of the Esophagus.—Although cancer of the esophagus occurs in women, its rarity as the cause of indigestion in women is attested by the fact that among more than 2,000 women who have chronic dyspepsia included in this series there was no instance of the condition. Among the men included in this study, carcinoma of the esophagus was considered the cause of indigestion in less than 1 per cent of instances before the age of 60 years. Three per cent of the men in their sixties and 4 per cent of the men more than 69 years of age were found to have cancer of the esophagus on consultation at the clinic because of indigestion.

Cancer of the Pancreas.—Among the malignant conditions responsible for indigestion, carcinoma of the pancreas ranks next in numerical importance to carcinoma of the stomach in male patients. In the series under consideration we found no instance of cancer of the pancreas among patients less than 45 years of age. In the late forties, 1 per cent of the men coming to the clinic because of dyspepsia were found to have malignant lesions of the pancreas. From this age to 70 years there was a progressive increase in the relative importance of carcinoma of the pancreas among the causes of indigestion.

Between the ages of 65 and 69 years, 7 per cent of the patients who presented themselves for relief of indigestion were found to be harboring a malignant lesion of the pancreas.

Among the women included in this study, cancer of the pancreas was far less commonly the cause of indigestion than among the men. This series includes 638 women aged 40 years and older who sought relief from dyspepsia. There were among these only two instances of carcinoma of the pancreas; one woman was in the early forties, the other in the early fifties.

Cancer of the Gallbladder and Bile Ducts.—Although malignant disease of the gallbladder and bile ducts must be considered among the causes of indigestion, it is actually one of the less common causes of such symptoms.

These diseases are extremely rare in men. Among 844 men 40 years of age and older who made a primary complaint of indigestion there were two instances of cancer of the bile ducts and one of cancer of the gallbladder.

Among the women of this group there were three instances of cancer of the gallbladder and one of cancer of the bile ducts. Two cancers of the gallbladder and one involving the bile duct occurred in women past the age of 64 years.

Cancers Involving Organs Other Than Those Aforementioned, Responsible for Dyspepsia.—Patients who have carcinomas that involve the colon or rectum occasionally present themselves because of symptoms of dyspepsia. Similarly, cancers of various other organs

such as the uterus, the bladder or the kidney, probably because of metastatic lesions, occasionally produce symptoms of chronic indigestion sufficiently severe to send such patients to their physicians with dyspepsia as their major complaint.

SUMMARY

The interest of medical and social workers pertaining to the crippled child, the tuberculous, the feebleminded and the epileptic is well known. Even the patients with social diseases have their benefactors. During recent years educational programs have taught the woman who has a mass in her breast and the patient who has an unhealed ulcer to seek the advice of a physician. Altogether too often, however, the patient who perennially complains of dyspepsia is left to follow the advice of a radio announcer or a drug clerk. The youthful sufferer from dyspepsia who allows himself to be treated in this way may do himself no harm, but the man past middle age who is a chronic sufferer from indigestion pursues a dangerous course by following this type of treatment. Chronic dyspepsia in a man who has reached the age of 60 years is a symptom of very grave possibilities. Of the men of this age who came to the clinic because of indigestion, 39 per cent were found to have cancer. In men of 70 years and older, cancer was actually demonstrable as the cause of their dyspepsia in 58 per cent of instances.

A study of the incidence of cancer according to five year age groups makes it possible to construct a picture in serial sections that shows the threat of this disease to the patient who has chronic indigestion. Several interesting trends in the behavior of carcinoma became evident from this study (chart 4). Among men, cancer was almost three times as frequently the cause of indigestion in the late forties as it was in the early forties. From the age of 45 to 55 years the incidence of cancer remained comparatively stationary. In the late fifties there was an appreciable increase in the incidence of carcinoma as the cause of indigestion. The onset of the serious threat of cancer in men, however, occurred at the age of 60 years. This seems definitely to represent the beginning of the cancer age period of the male dyspeptic patient.

Interestingly, this is from five to ten years earlier in life than a similar increase in incidence of cancer as the cause of indigestion among the women included in this series. The incidence of cancer as a cause of indigestion in females was 7.9 per cent between the ages of 45 and 49 years. I was surprised to find a gradual diminution in the relative importance of cancer among the women included in this group until the age of 65 years was reached. Actually, women between the ages of 60 and 64 years were found to have cancer when they presented themselves because of dyspepsia only about half as frequently as did the women in the late forties. After the age of 64 years, however, women seem to enter the dyspepsia-cancer age period. Cancer of the stomach was responsible for indigestion in these female patients six times as frequently between the ages of 65 and 70 years as it was in the early sixties. Women of 70 years and older who came to the clinic because of dyspepsia were found to have cancer in 30 per cent of instances.

The organ most frequently invaded by cancer responsible for dyspepsia was the stomach. Next in order of frequency was the pancreas. Carcinoma of the pancreas is much more frequently found in men than in women. This is true also of carcinoma of the esophagus. Cancer of the liver, gallbladder and biliary duct system was relatively uncommon among the causes of indigestion in this group of patients.

The advisability of continuing the search for cancer, even when this is not demonstrable in the upper portion of the digestive or accessory digestive tract, becomes evident when one considers the variety of sites that harbored such a lesion when the patient's presenting complaint was indigestion. Not only did patients with carcinoma of the colon or rectum present themselves at times because of dyspepsia but also patients who had malignant lesions of the pelvic region or kidney with metastasis to abdominal organs, or to other organs such as the lung, occasionally sought aid because of symptoms attributed by them to digestive disturbances. This series also includes some instances in which patients whose major difficulty was indigestion were found to have widespread abdominal cancer in whom it was impossible or not practical to determine the exact site of the primary lesion.

The importance of investigating the cause of indigestion, even when the complaint is primarily related to some other difficulty, is indicated by the fact that among the 4,656 patients there were 2,208 who presented other complaints primarily and yet, during the course of their examinations, they mentioned the fact that they had experienced some indigestion. Of these, between 2 and 3 per cent were found to have cancer which was considered the cause of the indigestion, which they had considered of minor significance.

CONCLUSIONS

1. Dyspepsia is caused by cancer much more frequently in men than in women.

2. Cancer begins to become a relatively frequent cause of indigestion in both sexes at about the age of 45 years.

3. There is a pronounced increase in the incidence of cancer as the cause of indigestion in later life. In this series, 39 per cent of the men who had a primary complaint of indigestion who were between the ages of 60 and 69 years of age had cancer. Of the men of this group beyond the age of 70 years, 58 per cent were found to have malignant disease. Women between the ages of 65 and 69 years who presented themselves because of dyspepsia had cancer in 16 per cent of cases, and after the age of 70 years in 30 per cent of instances.

4. Men seem to progress into a definite dyspepsia-cancer age from five to ten years earlier in life than the women. This age in men started in the late fifties and in women between the ages of 65 and 70 years. An exhaustive search for cancer should therefore continue in cases in which dyspepsia is the major complaint and when patients have reached the cancer age, even when another less formidable cause for such a symptom has been discovered.

5. It has been shown frequently that physicians treat their own dyspeptic difficulties too lightly. After the age of 45 years such symptoms should be evaluated with meticulous care and this should include roentgenologic investigation. Physicians should apply the same principles to their patients who have chronic complaints that relate to the stomach.

6. It seems to me that an educational program having for its purpose the enlightenment of the public with regard to the hazards of nonprofessional treatment of dyspepsia after the age of 45 years, and particularly

throughout the dyspeptic-cancer age period would produce some highly desirable results. To make people who suffer of persistent dyspepsia at these ages more conscious of the possibilities of cancer would undoubtedly result in the detection of many more cancers than now can be diagnosed; some of these lesions would certainly lend themselves to successful surgical treatment, and thus such a program would result in the saving of some lives.

CANCER OF THE RECTUM IN YOUNG PERSONS

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AND
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Carcinoma has been regarded up to comparatively recent years as a disease limited entirely to middle and later age groups. Collected reports in medical literature before 1900 emphasized the extreme rarity of cancer occurring in the first three decades of life. For example, Gusserow [1] in 1886 reviewed 3,385 cases of cancer including epithelioma and found only two that had originated before the patients were 20 years of age. De LaCamp [2] was able to find only nineteen cases of carcinoma in persons under 20 years of age in a total group of 9,963 cases recorded previous to 1897. Williams [3] reported in 1898 that in a study of 806 patients with carcinoma he found only one under 20 years of age. Later he collected 11,934 cases and reported that less than 1 per cent of the patients were under 30 years of age.

Several reporters since 1910 have called attention to an apparently increasing incidence of carcinoma, more particularly carcinoma of the large intestine, in young persons.

In 1914 Bauer and Bertini [4] collected twenty-one cases of cancer of the cecum and sigmoid in persons under 26 years of age and observed that less than nine months elapsed from onset to death in nineteen of the cases. In 1923 Phifer [5] was able to find references to forty-nine cases of cancer of the rectum and sigmoid in children under 20 years of age and reported that twenty-three of twenty-six patients followed up were known to be dead.

Fowler [6] in 1926 made a study of 112 cases of pathologically proved carcinomas in patients under 26 years of age. The largest group of these was found in the colon and rectum, twenty-one cases, or 18.7 per cent; fourteen, or 12.5 per cent, were in the rectum and rectosigmoid. Of the latter group he reported that twelve were dead, one was alive nine months after operation but with recurrence and one has not been followed. The youngest was 16 years old. The average time from onset of symptoms to operation was ten months. The average time from the onset of symptoms to death was two years one month. Fifty per cent of the patients with colonic and rectal cancer had lesions in the liver or in distant lymph nodes. Sixty-four per cent had involvement of the neighboring nodes at the time of the operation. He found that the family history was positive for malignant diseases in 20 per cent of the group. In eight cases a palliative colostomy was performed. In four cases the abdomen was closed without surgery; in nine cases resection of some type was performed. Fowler believed that, while the presence or absence of involvement of lymph nodes in rectal carcinoma in the young was without prognostic value, because all his patients with rectal carcinoma died regardless of involvement of the lymph nodes, there is a high percentage of involvement of lymph nodes and the average postoperative life is shorter (16.7 months) than in similar cases in the adult. Colloid cancer occurred in 14.3 per cent.

Fowler's conclusions were that carcinoma is more common in youth than is generally recognized, that heredity is the greatest etiologic factor and that the lack of hyalinization, fibrosis, lymphocytic infiltration and cellular differentiation may be responsible for the increased degree of malignancy of carcinoma in the young.

Rankin and Comfort [7] in 1929 believed that the incidence of cancer of the rectum in young persons was probably proportionately higher than the incidence of cancer invading all organs of the body in persons of the same age. From 1907 to 1926, 3.8 per cent of all rectal cancers seen at the Mayo Clinic were in persons under 30 years of age. There was no difference in the symptomatology in this group, although the duration of symptoms was two months less. Metastasis was found to occur more frequently, 63 per cent as compared with 46.4 per cent in older age groups. The proportion of carcinomas graded 3 and 4 were relatively higher and good results followed treatment in young patients 50 per cent less often than in the average case of carcinoma of the rectum.

TABLE 1.—*Cancer in the Young: Under 30 Years*

Name	Race and Sex	Age	Duration in Months	Type	Grade	Treatment	Result
F. S.	White ♀	16	24?	Adenocarcinoma, polypoid	1	Coagulation	Well 2 years
L. S.	White ♂	16	7	Adenocarcinoma with nodes	2	Colostomy	Died 1 year from onset
T. L.	Negro ♂	22	9	Adenocarcinoma with nodes	2	Perineal resection	Alive 5 months
J. H.	White ♀	27	5	Adenocarcinoma with nodes	4	Colostomy and radiation	Alive, well 19 months
J. C.	White ♂	27	6	Adenocarcinoma with nodes	1	Perineal resection	Recurred; died 2 years
A. H.	White ♀	28	10	Adenocarcinoma	2	Colostomy	Died of operation
J. A.	White ♀	29	3	Adenocarcinoma with regional nodes	2	Two stage Lahey	Recurred, died

Jordan and Chamberlin [8] in 1937 reported that of 1,236 cases of carcinoma of the digestive tract seen at the Lahey Clinic 3.4 per cent of the patients were 35 years of age or younger. Of these forty-one cases, twenty-five were of the rectum and sigmoid. Cattell,[9]

From the Section on Proctology, Baylor University College of Medicine.
Read before the Section on Gastro-Enterology and Proctology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

1. Gusserow, A.: Aetiologie des Carcinoma Uteri, Deutsche Chir. **57**: 211, 1886.
2. De LaCamp, quoted by Fowler.[6]
3. Williams, W. R.: Malignant Tumors of Infancy, Childhood and Youth, Lancet **2**: 481, 1898.
4. Bauer and Bertini, quoted by Fowler, R. H.: Carcinoma in the Young, M. Rec. **87**: 730-732 (May 1) 1915.
5. Phifer, C. H.: Cancer of the Rectum in Childhood and Adolescence, Ann. Surg. **77**: 711 (June) 1923.
6. Fowler, L. H.: Malignant Epithelial Neoplasms in Persons Under Twenty-Six Years of Age, Surg., Gynec. & Obst. **42**: 73 (July) 1926.
7. Rankin, F. W., and Comfort, M. W.: Carcinoma of the Rectum in Young Persons, J. Tennessee State M. A. **22**: (June) 1929.
8. Jordan, Sarah M., and Chamberlin, D. T.: Cancer of the Digestive Tract in the Young, S. Clin. North America **17**: 815-820 (June) 1937.
9. Cattell, R. B.: Carcinoma of the Rectum, S. Clin. North America **17**: 821-826 (June) 1937.

reporting statistics from the same source, found that in a series of more than 300 cases of carcinoma of the rectum 16 per cent were under 40 years of age.

Hall and Bagby[10] in 1938 reported four cases of rectal cancer in patients under 31 seen in a series of 134 young persons with carcinoma and stated that the ultimate results were wholly unsatisfactory and that, while the grading of microscopic sections and the symptomatology in persons 30 years of age or younger are similar to those in the older age groups, the condition is more malignant and has a poorer prognosis.

TABLE 2.—*Cancer in the Young: From 30 to 35 Years*

Name	Race and Sex	Age	Duration in Months	Type	Grade	Treatment	Result
G. C.	White ♀	30	8	Adenocarcinoma with extension to vagina	3	Excision	Alive 9 months
E. R.	White ♂	30	10	Gelatinous adenocarcinoma with nodes	2	1 stage abdominoperineal resection, radiation	Alive 17 months
C. M.	White ♀	30	2	Adenocarcinoma with nodes	2	Colostomy and perineal excision	Recurred; died 10 months
I. C.	Mexican ♂	32	12?	Squamous cell in old fistula	2	Perineal excision	Alive 5 years
J. G.	White ♀	32	3	Gelatinous adenocarcinoma with nodes	3	Colostomy (inoperable)	Died 8 months
F. R.	White ♂	33	12	Gelatinous, polypoid	2	One stage abdominoperineal resection	Alive 6 months
O. F.	White ♀	33	4	Papillary adenocarcinoma	1	Coagulation	Alive, well 2½ years
L. S.	White ♀	33	3	Adenocarcinoma	2	Coagulation, radiation; 2 perineal resections	Recurred; died 3½ years from onset
L. J.	White ♀	35	12	Adenocarcinoma	2	Lahey operation	Alive 4 years, 8 months
F. L.	White ♂	35	12	Adenocarcinoma with inguinal glands and regional nodes	2	Colostomy, x-ray	Died 20 months

Because in our own wards we have observed from year to year an increasing number of young persons with cancer in the rectum, it was decided to analyze a series of 100 consecutive cases of rectal cancer to determine the relative incidence of this disease in persons 35 years of age and under in this vicinity, the grade of malignancy present in younger persons as compared with that in more mature years and such other factors as might enter into the prognosis of the younger age group. In this series, cases of sarcoma and cases in which a complete pathologic study and follow-up had not been made were omitted.

In our series (tables 1 and 2) 2 per cent were 16 years of age, 7 per cent were under 30 and 17 per cent were under 36; eight of the patients under 36 were males, one was a Mexican (the only one of this race in the group) and one was a Negro. Three Negroes were included in the older age group, 4 per cent of the entire series being of this race.

The average duration of symptoms for the younger age group was seven months—a period briefer by more than three months than the average duration of symptoms for rectal cancer. The shortest duration of symptoms was three months, the longest twelve months. It should be explained that in two persons of this group the malignancy had been engrafted on previously benign lesions—a polyp in one and an anal fistula in the other. For this reason the time of onset of the malignant process could not be determined with certainty and these two cases were therefore omitted from the calculation of the average duration of symptoms.

There was one postoperative death in the group of seventeen patients under 36. Seven other patients have died in from eight to twenty months following surgery. These seven patients had demonstrable involvement of the lymph nodes at the time of surgery. Four patients are alive and apparently well for periods longer than two years. Five are living, four of them clinically well, for periods of less than two years; these living and well for periods sufficiently long to offer an encouraging prognosis include a white woman, in whom resection was done at the age of 35—no involvement of the lymph nodes being present—who has survived four and one-half years, a Mexican man of 32 who is well five years after a grade 2 squamous cell cancer of the anus was excised, a drawing of which is reproduced in the accompanying illustration, and two others whose low grade papillary cancers were coagulated two and one-half and two years ago.

While 54 per cent of these seventeen patients are still living, the ultimate prognosis in the five patients surviving for two years or less is not good, as in each the malignancy was found to have extended to lymph nodes or to adjacent tissues at the time of operation.

The two age groups were studied carefully to determine any possible variation in the degree of malignancy, rapidity of extension and other pathologic factors possibly influencing prognosis.

Table 3 is a condensed summary of the results of grading, by Broders' method, the tissue removed from each tumor. It will be observed that the increased percentage of higher grades which might be expected to occur in the younger age group was not present, there being fewer grade 3 cancers proportionately and more grade 2 cancers than in the older age group. The incidence of extremely benign and extremely malignant growths was about equal. However squa-

Postoperative specimen of cancer of the anus of a grade 2 squamous cell type in a man aged 32, a Mexican, with long-standing fistula. The condition is apparently cured.

10. Hall, Norman, and Bagby, J. W.: Carcinoma in the First Three Decades of Life, J. A. M. A. 110:703-706 (March 5) 1938.

mous cell cancer, which is believed to be more amenable to treatment, was present in 0.6 per cent of the younger age group and in 4.8 per cent of the older patients. Moreover, colloid or gelatinous cancer was found to be present in a much higher proportion in younger patients (18.7 per cent) as opposed to 7 per cent for the older age group and 9 per cent for the total series.

Rankin [11] stated in 1929 that the incidence of colloid cancer in a ten year period at the Mayo Clinic was practically 5 per cent, although other observers have reported somewhat higher figures, especially if the colon is included. While colloid cancer is usually slow of growth and late to metastasize to the lymph nodes and other organs, it spreads by permeation and may cause extensive thickening of the wall of the affected organ.[12] It is usually difficult to eradicate and the eventual mortality is greater than in other types of carcinoma. The patients in the younger age group whose growth was of the gelatinous type had an average duration of symptoms of eight months, longer than the average for the group, but it was discovered that in each case the regional lymph nodes were already grossly involved or adjacent structures were permeated.

Microscopic gross involvement of adjacent or distant lymph nodes was the most striking characteristic of the cases in the younger age group. In 52 per cent microscopic examination was unnecessary to determine this invasion and in 11.7 per cent there was definite extension to adjacent extrarectal tissues; therefore any difference in prognosis in these groups of cases must be attributed, so far as this series is concerned, to an absence of natural barriers rather than to an inherent higher degree of malignancy.

TABLE 3.—*Cancer in the Young: Grades of Malignancy*

	Grade			
	1	2	3	4
1-35 years	2 (11.8%)	11 (64.7%)	2 (11.7%)	1 (5.8%)
36 years and over	12 (14.4%)	43 (51.6%)	24 (28.87%)	4 (4.8%)
Entire group	15%	54%	30%	5%

Theilhaber [13] in 1914 attributed the local disposition of aging tissue to cancer to diminution of cellular elements and contraction of blood vessels, which is also seen in scars and areas of chronic inflammation.

This theory that senile tissue is more likely to be affected by carcinogenic agents has been offset to a considerable extent by the work of Yamagiwa and Ichikawa [14] at the University of Tokyo in 1916 and by the continuation of their investigations by Murray [15] of the Imperial Cancer Research Fund in London in 1929. They succeeded in producing true cutaneous cancer on the ears of rabbits by applications of crude tar. They found that it was impossible to induce cancer rapidly, repeated applications over a period of months being necessary. The time element, of course, suggests an explanation for the greater occurrence of malignant growths in older persons, but it was also found that, when old mice were subjected to chronic irritations by painting on of tar, carcinoma did not develop more rapidly than in younger mice but rather the reverse; when young mice were used as subjects, malignant new growths developed at an age which would correspond to youth in man.

Whether the statistical increase in the number of young persons in whom carcinoma develops is real or apparent is at this time a question for speculation. The gradual but constant increase of recognized malignant conditions in persons in the lower age brackets does suggest that etiologic factors are at work which have lowered a former partial immunity of young persons to cancer, especially of the lower part of the intestine. If this increase is not real, it constitutes a sweeping condemnation of earlier diagnostic methods as well as of the former teaching that carcinoma should be considered in a differential diagnosis only when the patient is past middle life.

SUMMARY

It appears that there has been an actual gradual rise in the number of young persons found to have cancer in general and carcinoma of the rectum in particular.

A consecutive series of 100 of our own cases of rectal cancer has been analyzed to determine the relative incidence in persons of early and later life. In the group studied, 7 per cent were under 30 years of age and 17 per cent were under 36, slightly higher figures than those reported by others in even the immediate past.

There was no evidence that the grade of malignancy present in this group was higher in young persons, but colloid cancer was found more frequently and squamous cancer less frequently. The younger group provided better surgical risks, and resection was attempted in a greater number than in older persons.

Since this younger group, in contradistinction to some other published reports, does not show a greater percentage of higher grades of carcinoma, it must be assumed that the earlier spread of the lesion, indicated by shorter than average duration of symptoms and early gross involvement of lymph nodes and neighboring structures, is due to a partial absence of defensive barriers to early spread of the lesions in young persons.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. RIVERS AND DRS. ROSSER AND KERR

DR. BURRILL B. CROHN, New York: I fail to gain a great deal from statistical papers on this subject. If one says to a patient, "The mortality in partial gastrectomy is 5 per cent," the patient will respond "Do you think I will be one of the 5 per cent?" That of course is the difficult part of the question to answer. To say that there is a 5 per cent incidence of dyspepsia with carcinoma at 25 years of age is an interesting fact, but its clinical application is very difficult. Isn't it true that the diminished figure one quotes in women as compared with men is due to the rise of other causes for female dyspepsia in the same period? In the years from 45 to 65 there enter into the problem a large number of menopausal symptoms. Wouldn't the great increase in that type of indigestion overbalance the number of carcinomatous cases so as to give a relative depression of the carcinoma cases? Isn't it true that there are several variables which have to be taken into consideration which to a greater or lesser extent invalidate the exact data one gives for the incidence of carcinoma as the cause of indigestion? Has it been your experience that carcinoma diminishes in old age? One sees frequently in statistics the fact that the carcinoma curve rises to the age of 65 or 70 and seems to diminish in the eighth decade. I have wondered whether the diminution is actually or relatively true. It was because of the carcinomata of the rectum in youth that I was impressed to the point of formulating roughly a rule that

11. Rankin, F. W., and Chumley, C. L.: Colloid Cancer of the Colon and Rectum, Arch. Surg. **18**: 129 (Jan., pt. 1) 1929.
12. Parham, Duncan: Colloid Carcinoma, Ann. Surg. **77**: 90 (Jan.) 1923.
13. Theilhaber, A.: Causal Factors in the Disposition to Carcinoma, Surg., Gynec. & Obst. **19**: 650, 1914.
14. An Explanation for the Influence of Age on the Occurrence of Cancer, editorial, J. A. M. A. **94**: 870 (March 22) 1930.
15. Twenty-Eighth Annual Report of the Imperial Cancer Research Fund, London, 1928-1929.

carcinoma in older people occurred usually in the upper alimentary tract. Did you ever see a carcinoma of the esophagus in any one of 18 or 20, or did you ever see a carcinoma of the tongue in a young person? Carcinoma of the esophagus appears in older persons, of 50 and 60, and carcinoma of the stomach in the middle ages; carcinoma of the colon, particularly the lower part of the colon, and of the rectum is the type of carcinoma to which young people are subject. Carcinoma in young people must be related to polyps and polyposis; partial congenital polyposis is not unusual. One should not trust a biopsy of a polyp; if it is suspected of being malignant, it should be so regarded in spite of negative biopsies. I would ask Drs. Rosser and Kerr whether they changed the technic for the young people and did a more radical operation, in the light of the fact that the mortality is so much higher, or that the incidence of metastases of the rapid downward course is so much more likely to be fast and malignant.

DR. HENRY A. RAFSKY, New York: It is generally recognized that, of all the cancers of the so-called inaccessible sites which cause chronic dyspepsia, cancer of the stomach is by far the most common. Still, according to the Metropolitan Life Insurance Company's bulletin, the annual trend as percentage of the average rate from 1917 to 1935 showed a comparatively larger increase in cancer of the intestine and the largest increase in cancer of the pancreas in white persons. The number of deaths annually from cancer of the pancreas in Negroes was too small to warrant calculation. A survey of these groups showed that there were 9.8 per cent more males than females with cancer of the stomach, 0.3 per cent more men than women with cancer of the pancreas and 2.6 per cent more females than males with cancer of the intestine. Cancer of the stomach showed a progressive increase after 35 and reached its maximum between 65 and 74 years. Notwithstanding statistics, however, we must not allow the age incidence of cancer of the stomach to influence us too strongly in differentiating ulcer and cancer, and antral gastritis and cancer. Furthermore, special methods of examination may be required to make the distinction. Drs. Rosser and Kerr's presentation is of timely interest because many still think that cancer of the rectum is rare in persons below 40. At Lenox Hill Hospital from 1923 to April 1939 9.9 per cent of 131 cases of cancer of the rectum were in patients below 36 and 5.4 per cent in patients of 30 years or less, the youngest being a girl of 18 and a lad of 17. Similar statistics were found in a series of fifty-seven patients below 36 with cancer of the rectum treated at Beth Israel Hospital from 1935 to 1939. Statistics compiled by the Metropolitan Life Insurance Company showed that in individuals who died from cancer of the rectum from 1917 to 1935 between the ages of 25 and 34 the annual trend as percentage of average rate was plus 0.3 per cent in white males and plus 1 per cent in white females, and plus 7.9 per cent in Negro males and minus 0.4 per cent in Negro females. This definitely indicates an annual trend upward. It is true that our diagnostic approach to this problem has undergone a change in recent years, but it is questionable whether this alone entirely explains the increase in cancer of the rectum in young people.

DR. JOHN M. BLACKFORD, Seattle: Dr. Rivers' paper has interested me because of work I did along roughly parallel lines several years ago. I wondered particularly about the possible source of error that Dr. Crohn has drawn attention to. The remarkable drop in the incidence of cancer in women from 45 to 55 seems unexplainable, unless it is explained on the basis that Dr. Crohn has suggested. Several years ago we had occasion to work out the relative incidence of sex by decades as patients come to see us at the Mason Clinic in Seattle. By sampling consecutive thousands of registration, we determined that approximately an equal number of males and of females registered with us; however, between 45 and 55 the number of females is considerably higher than the number of males. Dr. Rivers did not state whether he had made any such correction in his figures; if he has not, his curve will be considerably altered by this fact. In the study of gastric cancer and the relative incidence of lesions of the gastrointestinal tract, we attempted to determine how often we saw gastric ulcer in proportion to gastric cancer in our clinic. Our records were subsequently compared with those from the Mayo Clinic and we were rather gratified to find that our relative incidence agreed with theirs except that they had a higher percentage of cancer. They had a little more than twice as many cases of cancer of the stomach in proportion to our figures with relation to gastric and duodenal ulcer. We were in almost identical agreement regarding the incidence of gastric and duodenal ulcer. To explain this fact, we all know that some patients wander to Rochester from anywhere in this country after being given a hopeless prognosis at home. I feel, in contrast to Dr. Crohn's remark, that statistics are valuable for two reasons: They give trends and they make us think. It is certainly most important to know the relative incidence of carcinoma as people are getting older, in order to put us on our guard in looking for cancer in the patients who come to see us. Between 25 and 30 per cent of patients give a long standing history of indigestion, with symptoms which may be relieved by alkalis, and a remarkably high percentage of such patients have gastric acidity present and frequently high acidity. A warning should be sounded here that we should not miss the clinical diagnosis of gastric carcinoma because the patient has high acidity.

DR. LOUIS J. HIRSCHMAN, Detroit: The study by Drs. Rosser and Kerr is a mandate to those who are accustomed to examine many patients yearly with symptoms pointing to the lower intestinal tract. We have got to meet with our county and state medical societies and teach them, and our undergraduate and graduate students that there is a cancer age and that the so-called cancer age is getting lower and lower. Every one of us is astounded at the increase in the number of patients suffering from carcinoma of the lower bowel below the age of 45. I teach my students that there are as many instances in persons below 45 as above. It is unfortunate that the young patients with carcinoma of the lower bowel—the youngest I have ever seen is 16—are treated for diarrhea, for colitis or for dysentery, before the thought occurs that an examination of the anus and rectum and colon, first instrumentally and then roentgenologically, is indicated. In my experience, carcinoma in most of these patients in the second and third decades has progressed pathetically far. The diagnosis as a rule is not very difficult. There is one thing that we who see many of these cases should do and that is to spend more time advising those who see them early as to what to look for rather than showing charts and moving pictures of our preferred surgical technic in removing carcinomas. We should stress the point that the younger person must be suspected as well as the older one. We shall thus have done much to assist these young people with carcinoma and much to assist the general man in the diagnosis of malignant conditions of the lower intestinal tract.

DR. ANDREW B. RIVERS, Rochester, Minn.: Dr. Crohn's dislike for statistics is shared by most of us. There is no question, however, that many facts can be established by statistical studies. The statistical method is, in fact, the only method of obtaining certain information which is readily applicable to problems such as those which we have discussed today. The purpose of the survey reported in this paper is to make us more cautious in the evaluation of dyspeptic symptoms in elderly patients. I think that Dr. Rafsky's discussion is very much to the point and I am in entire agreement with him that relaxation of caution regarding the diagnosis of cancer is lamentable. This is particularly true when these patients have reached the dyspepsia-cancer age. I should like to point out again that beyond the age of 60 years, even though other causes for indigestion may have been found, the possibility of cancer must still not be overlooked. Dr. Blackford's comments regarding the difference in the sexes relative to the incidence of cancer are important. I am unable to throw any light on this particular phase of the cancer problem. Women seem definitely less subject to cancer of the upper gastrointestinal tract than do men. This fact should be remembered in attempting to evaluate the cause of dyspepsia in the different sexes.

DR. CURTICE ROSSER, Dallas, Texas: I hope Dr. Crohn was not suggesting that, while statistics do not lie, statisticians often do. Certainly the definite trend in the statistics of age

incidence in rectal cancer as given in the literature is impressive, and I was happy to have Dr. Rafsky bring additional support to the observation which we have made that there apparently is a definite, constant, gradual rise in the incidence of cancer of the lower bowel in young individuals and that the rise has been so gradual and so constant as to offset any suggestion that it is fictitious or due to lack of proper diagnosis. Dr. Crohn asks whether our surgical maneuvers are not more radical in young persons. They are more radical, for two reasons: one is that we are tempted by the fact that these patients are usually in good general condition for resection of the lesion, even though metastasis may be present, and we are also more inclined to do an abdominoperineal rather than a perineal excision, because we know they can take it better. Unfortunately, no matter how radical the procedure, the result seems in most cases to be the same.

ARTERIOSCLEROTIC GANGRENE

RELATION OF THE AMPUTATION STUMP TO MORBIDITY AND MORTALITY

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Arteriosclerotic gangrene of the lower extremity is a fairly frequent occurrence in the experience of both physicians and surgeons. The maiming possibilities of such a condition are of course evident. However, the profession as a whole does not fully appreciate the high immediate mortality. Approximately one third of all these patients die during the course of their subsequent amputation.

Because of this seemingly excessive mortality, numerous studies have been made in an attempt to remedy the situation. In institutions giving particular thought and care to the problem the mortality is considerably under that mentioned. For instance, McKittrick [1] reported a mortality approximating 15 per cent. Others [2] have achieved a mortality of about 20 per cent.

The means by which this reduction in mortality has been attained is worthy of consideration by all who in any way care for patients with arteriosclerotic gangrene. The recommendations which have been made may be briefly stated as follows:

1. Careful individual consideration of each patient's problem rather than the too frequent perfunctory amputation in the hands of a surgeon not particularly interested or schooled in the factors involved.

2. A helpful cooperation between the medical and surgical staffs. Needless to say this is particularly important when diabetes is superimposed on the arteriosclerotic gangrene. With the diabetes under control the patient should not offer a greater operative risk than a nondiabetic patient. A careful evaluation of the cardiac and renal situation by the internist may be a life saving matter in determining just what procedure and anesthesia are safest.

3. Special surgical services and operative teams for amputation, which have definitely decreased the hospital mortality.[3] While this arrangement has certain objections as applied to most institutions, there can be no doubt that it makes for better results.

4. Finally, the type of amputation which is carried out at the operative procedure.

It is the last phase, the treatment of the amputation stump, which is the principal concern of the present study. Does the particular type of amputation bear any relation to the morbidity or mortality? It is the writer's opinion and the opinion of others [4] that it does. It is also our conviction that much more thought should be given to securing a live patient as an end result than a perfect weight bearing stump, a stump which all too frequently is never used.

More specifically the problem resolves itself into whether the usual anatomic fascial plane closure of the amputation stump is justified in cases of arteriosclerotic gangrene.

GENERAL CONSIDERATIONS

The problem of amputation of extremities having vascular damage sufficient to cause spontaneous gangrene is quite different from that presented by amputation for trauma. In the latter practically any of the many advocated types of plastic anatomic amputation may be carried out, because the blood supply to the area of operation is normal. The reverse is true in arteriosclerotic gangrene. Here the vascular bed has been diminished to the point where it will no longer sustain normal metabolism in the distal portion of the extremity. The effect of this on wound healing is evident. If a more or less complicated repair is carried out on the stump of such an extremity, the effective blood supply is still further diminished. The result too often is necrosis and suppuration of an otherwise beautiful anatomic repair.

Probably the most frequent type of operation used in arteriosclerotic amputation, whether in the thigh or the leg, is that which will be designated as the "fascial layer closure" type. Here the muscles and fascia are carefully sutured in one or more layers over the cut end of the tibia or femur. Skin flaps which have been fashioned and occasionally stripped from their underlying fascia are then carefully sutured in place over the fascial and muscular layers.

It is fully admitted that when such a repair heals by primary union the result is ideal and all that could be desired. However, in the case of arteriosclerotic gangrene this anatomic closure frequently becomes infected. The careful approximation of tissues with multiple constricting sutures has further devitalized tissues which at best have a poor blood supply.

It is of course highly desirable to obtain a good weight bearing stump at the first operation. This, however, is not justified if there is an appreciable added risk to the patient. It is the purpose of the present study to evaluate this risk and compare the results with those of simpler operative procedures in which the stump tissues are traumatized to a minimal degree.

Recently Crossan [5] has advocated the simplest type of chop amputation. He has indicated the fallacies of dissecting skin flaps and muscle flaps at the expense of their own blood supply. McKittrick [1] and also Smith [6] have expressed preference for a guillotine chop amputation, especially when there is any evidence of infection. The stump is left wide open so that maximal drainage is allowed and there is no interference with

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2. Taylor, F. W.: Amputation Stump of Arteriosclerotic Gangrene, Surg., Gynec. & Obst. **67**: 114 (July) 1938. Crossan, E. T.: Two Stage Amputation for Diabetic Gangrene of Leg, Am. J. Surg. **33**: 19 (July) 1936. Williams and O'Kane,[3] Smith.[6]

3. Williams, F. W., and O'Kane, T. J.: Mortality in Surgical Diabetes, Surg., Gynec. & Obst. **64**: 956 (May) 1937.

4. Leriche, R.: Amputations from the Viewpoint of Mortality, Presse méd. **42**: 1737, 1934. McKittrick,[1] Taylor,[2] Smith.[6]

5. Smith, B. C.: The Therapy of Surgical Complications of Diabetes Mellitus at Presbyterian Hospital in New York City, 1930-1935, Surgery **2**: 509 (Oct.) 1937.

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the remaining blood supply from constricting sutures. Of course a secondary operation is usually necessary after such a procedure. Frequently, however, this consists only of amputation of the bone at a higher level.

Another type of simple closure consists of merely closing the skin with several loosely tied interrupted sutures. The tissues are thus only slightly constricted, and drainage can easily take place from the margins of the skin. Sometimes when there is considerable danger of infection these sutures can be placed at the time of operation. Later, when the progress of the wound can be more accurately estimated, they can be tied. A wound handled in this manner seldom has to have a secondary operation.

Adhesive traction applied to the skin above the stump is of definite aid in relaxing the tension of the tissues over the bone.

One further point in the general consideration of a gangrenous extremity is the part played by infection. Frequently the gangrenous area may appear perfectly benign, only to harbor bacteria in the neighboring fascial planes. This may cause an immediate flare-up after operation. Other extremities are grossly infected. In both of these instances the patient's chance of survival is certainly much better with the wound left wide open without tension.

A trial suture is sometimes used with the intention of reopening the stump if evidence of infection should develop postoperatively. There is of course no alternative for such a situation. However, it is generally admitted that this produces a problem which is far more serious than if the wound had been left open. Sepsis too often thus gains a foothold which a debilitated patient is unable to meet.

The importance of infection as a cause of death was emphasized by McKittrick and Pratt.[6] They found that approximately one half of their postoperative deaths were directly or indirectly due to infection of the stump. This is in agreement with the figures for the series here reported.

MATERIAL

The cases studied represented consecutive admissions for arteriosclerotic gangrene of the lower extremity to the Indianapolis City Hospital and the Robert W. Long Hospital during the eight year period from 1930 to 1938. The greater part of these have been reported previously.[2] However, because of some rather interesting observations, the study has been continued so as to include the present larger number of cases. Cases in which major amputation was not performed have been excluded. Also excluded were those of amputation for vascular disease other than arteriosclerosis (atherosclerosis). Diagnoses were based on pathologic study of the amputated extremity.

No division of the cases was made as to amputation at the thigh or the leg. So far as the local stump healing is concerned, the same factors exist at the two sites. The blood supply to the thigh stump is of course better, but the same danger of infection and strangulation of tissue by anatomic repair is present at the two sites.

Cases of arteriosclerotic gangrene with diabetes and without diabetes are considered together with regard to stump healing. This is logical, since the local vascular and pathologic problem is the same. The diabetic patient has the added burden of diabetes, but so far as the local lesion is concerned this is important only when the diabetes is out of control. The resultant mortalities for the diabetic and the nondiabetic patient have been considered separately.

This all inclusive grouping is of course open to just criticism. However, practically the same ratios obtain for the figures on wound healing when the series is broken down into subgroups. Therefore there seems nothing to be gained over the presentation of the total figures.

MORTALITY

In the entire series of cases of arteriosclerotic gangrene 137 major amputations were done in 117 cases. There were forty-four hospital deaths, giving an amputation mortality of 32 per cent and a case mortality of 37.6 per cent. As might be expected, the patients with diabetes or infection showed a definitely higher mortality than those without complications:

A. In the cases of diabetes and arteriosclerotic gangrene ninety amputations resulted in thirty-one deaths, a mortality of 34.4 per cent. These deaths occurred in seventy-eight cases, giving a case mortality of 39.7 per cent. The mortality was even higher when local or systemic infection was an added complication. Of forty patients having local cellulitis, lymphangitis, adenitis or leukocytosis, twenty-one died, a mortality of 52.5 per cent.

B. In the cases of arteriosclerotic gangrene without the complication of diabetes there were forty-seven major amputations, with thirteen deaths (27.7 per cent). These deaths occurred in thirty-nine cases, giving a case mortality of 33⅓ per cent. Infection of the operative stump was an important factor in only four of the deaths. The remaining nine patients died as a result of systemic vascular disease, embolism or pneumonia.

These alarming mortalities are certainly cause for speculation.

TABLE 1.—*Fascial Layer Closure of Stump Used in Ninety Amputations for Arteriosclerotic Gangrene With and Without Diabetes*

	Cases	Per Cent
Deaths in the hospital	39	43.3
Deaths directly or indirectly due to infected nonhealing stump	18	46.0
Of the fifty-one survivors, stump necrosis and suppuration (secondary healing) occurred in	32	63.0
Of the fifty-one survivors, prompt healing occured in	19	37.0
Expectancy of prompt healing (based on original ninety cases)	19	21.1

STUMP HEALING

When a surgeon prepares skin flaps and muscle flaps and carefully closes these in layers over the end of the bone, he does so with the conviction that he will obtain prompt healing in the majority of cases. He likewise expects to obtain a good weight bearing stump whether the amputation has been done in the leg or the thigh. These laudable aims form a startling contrast with the actual results obtained, or at least with the results obtained in the present series.

Table 1 shows that in ninety cases of arteriosclerotic gangrene in which fascial layer closure was carried out there were thirty-nine hospital deaths (a mortality of 43.3 per cent). Further, it is noted that nearly one half of these deaths (46 per cent) were directly or indirectly due to an infected, nonhealing stump. This in turn must be largely attributed to faulty care of the stump

6. McKittrick, L. S., and Pratt, T. C.: Principles of and Results After Amputation for Diabetic Gangrene, Ann. Surg. **100**:638 (Oct.) 1934.

in constricting the already devitalized tissues with numerous sutures and not allowing adequate drainage.

Table 1 also shows that 63 per cent of the fifty-one patients who survived had suppuration and secondary healing of the stump. Prompt healing occurred in but nineteen (37 per cent) of these survivors. But, when one considers the entire group of ninety patients who received fascial layer closure, the percentage of stumps which healed promptly shrinks to 21.1. This figure represents the expectancy of prompt stump healing in those cases in which a fascial layer closure was performed.

With this outlook, 21.1 per cent of prompt healing and a mortality of 43.3 per cent, this type of closure is certainly questionable. It adds a definite risk which is not justifiable and should be reserved only for those patients who have an exceptionally good blood supply and no evidence of infection.

The question naturally arises, If the fascial layer type of stump closure is so hazardous, what have the other methods to offer?

Such a comparison of the operative procedures alone is of course invalid. Too many other factors enter into the problem. However, the differences in mortality are

TABLE 2.—*Hospital Mortality Following Amputation*

	Amputations	Deaths	Per Cent
Fascial layer stump closure	90	39	43.3
No suture, secondary closure	16	3	19.0
Loose skin closure only	31	5	16.0

TABLE 3.—*Average Postoperative Hospital Days of Surviving Patients*

	Days
Fascial layer stump closure	49.5
No suture, secondary closure	51.5
Loose skin closure only	37.5

so great that they should be cited. In table 2 it will be seen that when a fascial layer type of closure was done the mortality was 43.3 per cent. This dropped to 19 per cent when there was no closure or secondary closure and to 16 per cent when a loose skin closure alone was done.

These figures gain in weight when it is realized that, in general, patients with the most favorable prognosis received fascial layer closure. Also the patients with a less favorable prognosis, for whom the operator felt that primary anatomic closure was unsafe, are included in the second and third subgroups. Regardless of this, the mortalities are sufficiently lower and indicate the added risk of fascial layer closure.

HOSPITALIZATION

It is with the hope of securing primary healing and early discharge from the hospital that the operator attempts an anatomic stump closure. Yet it may be this very attempt which devitalizes the tissues of the stump to the extent that necrosis and infection occur, adding to the hazard and prolonging the hospital stay.

In table 3 is shown a comparison of the average number of postoperative days in the hospital for three different operative procedures. It will be noted that the average hospital stay after anatomic closure is high, 49.5 days. This is in spite of the fact that this subgroup contains numerous patients whose stump wounds healed promptly and who were discharged from the hospital between the fourteenth and twenty-first postoperative day.

From this it may be concluded that the average postoperative hospital stay was not reduced by fascial closure of the stump. On the contrary, it was increased by twelve days over the stay following simple skin closure.

It is of course desirable to obtain a good weight bearing stump. In the present series this seemed to be of secondary importance. Time and again the elderly patient was given an artificial limb only to discard it for crutches. This is in sharp contrast with the action of the younger patient who has had a traumatic amputation.

SUMMARY AND CONCLUSIONS

Arteriosclerotic gangrene with or without the complication of diabetes carries a heavy operative mortality.

In the present series, when major amputations were done the case mortality was 37.6 per cent and the amputation mortality 32 per cent.

While many factors enter into the problem, attention is called to the relation of operative procedure and stump healing to mortality.

The usual anatomic fascial plane closure in the majority of instances (*a*) devitalizes the already poorly nourished stump tissues, thus predisposing to necrosis and suppuration, (*b*) allows inadequate drainage for infected stumps or stumps which become infected, (*c*) results in only a small number of promptly healing stumps (21.3 per cent of those operated on in the present series), (*d*) definitely increases the operative risk and (*e*) does not shorten the average postoperative hospital stay.

Nearly one half of the hospital deaths are directly or indirectly attributable to necrosis and sepsis of the amputation stump.

In the great majority of amputations for arteriosclerotic gangrene no thought should be given to skin flaps or stump repair. The simple circular amputation is by far the safest. In general this consists of a circular incision of the skin at the operative site in the leg or thigh. The dissection is carried perpendicularly through the fascia and muscle layers at the level of skin retraction. No attempt is made to fashion skin flaps or separate the fascial planes, as these procedures tend to interrupt an already diminished blood supply. Gentle retraction on the muscles will allow bony resection at a somewhat higher level. When infection is a danger, no attempt is made to close the stump. This leaves it in a condition for maximal drainage. When infection is but a slight hazard, the skin may be closed with a few interrupted sutures. This allows drainage without constriction. When there is any doubt as to the possibility of sepsis, it may be well to place the skin sutures at the time of operation and, if the healing progresses satisfactorily, they may be tied a few days later. In the extremely septic patient, often with uncontrollable diabetes, the safest procedure would seem to be a simple chop amputation at or just above the knee, which minimizes the danger of opening or disturbing the muscle planes.

The anatomic fascial plane suture of the stump should be reserved for the exceptional case in which there is no infection and an abundant blood supply.

The surgeon must not lose sight of the fact that he is dealing with a very serious situation. The patient's life must receive prime consideration rather than the attempt to produce a perfect anatomic stump.

MAJOR AMPUTATIONS FOR ADVANCED PERIPHERAL ARTERIAL OBLITERATIVE DISEASE

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In the Peripheral Vascular Clinic of the Massachusetts General Hospital in the ten year period from Jan. 1, 1929, to Jan. 1, 1939, there have been 530 patients with sufficiently advanced arterial obliterative disease to require admission to the hospital. Of that number 204 have had single major amputations and fifty-eight have had bilateral amputations. My paper is based on this material.

GENERAL CONSIDERATIONS

The treatment of this trying condition should be concerned primarily with those measures which, with reasonable safety to the patient, hold out the greatest hope of painless independence consistent with the known prognosis of the disease and the age of the patient. It must be remembered that the peripheral lesion is but one manifestation of a generalized progressive process and that a protracted hospital stay to save a potentially useless extremity is neither a kindness to the patient nor an intelligent utilization of the beds of a charitable institution.

For an intelligent application of these criteria of treatment in the care of peripheral arterial disease, the cases must be subdivided into the three clinical entities of Buerger's disease, or thrombo-angiitis obliterans, peripheral arteriosclerosis and peripheral arteriosclerosis associated with diabetes mellitus. Each of these subdivisions has definite surgical characteristics and economic implications that justify a wide difference in procedure; the lesions are apparently similar, but the underlying pathologic process is different.

Progressive arterial disease did not precipitate a single major amputation of the upper extremity in the ten year period studied, although in many instances the vessels of the arm showed clinical evidence of advanced involvement in the same pathologic process that was the basis of the signs and symptoms in the leg.

Conservative Treatment.—Any method of treatment, such as sensory nerve block, incision and drainage, minor amputation or lumbar sympathectomy, that obviates the necessity of major amputation and yet rehabilitates the patient is always carried out if warranted by the status of the peripheral circulation. In a study of the same series of cases, McKittrick [1] has reported in detail the experience which my associates and I have had with the use of these conservative measures, but it might well be stressed here that the technical simplicity of an operation is by no means a true measure of its degree of conservatism, for an ill advised toe amputation or poorly conceived incision and drainage of an infected area may be the most radical procedure to which the patient could be subjected.

Diagnosis.—An appreciation of the presence of an impaired peripheral arterial circulation and a practical determination of its extent do not require the use of any instruments of precision, for simple palpation and observation readily reveal absence of or diminution in the intensity of the pulsations of the peripheral arteries as well as coolness and a color change of the skin not found in the normal extremity. Furthermore, the consistency with which the story of intermittent claudication, subjective coldness of the feet and persistent apparently trivial lesions of the toes is repeated should lead any surgeon to consider seriously the possibility of progressive arterial occlusion.

The results of urinalyses and the blood sugar levels determine whether or not diabetes mellitus is present as an associated complicating factor with arteriosclerosis.

As our criteria for establishing the differential diagnosis between arteriosclerosis and Buerger's disease have been reported in detail by Allen [2] and McKittrick,[3] it is sufficient to state here that the following constitute the salient differences between these conditions (table 1):

1. The incidence of Buerger's disease is less than one third of that for arteriosclerosis with and without diabetes.

TABLE 1.—*Factual Data, 530 Cases*

	Thrombo-Angiitis Obliterans	Arterio-sclerosis	Arteriosclerosis and Diabetes
No. of cases	112	176	242
Average age at hospital entry, years	42	68	56
Average duration of symptoms precipitating hospital entry, months	11	2½	1
Death within 5 years of successful amputation, %	15	62	61

TABLE 2.—*Incidence of Single and Bilateral Amputations, 530 Cases* *

	Thrombo-Angiitis Obliterans		Arterio-sclerosis		Arteriosclerosis and Diabetes	
	No.	%	No.	%	No.	%
No major amputation	77	69	65	37	126	52
Single amputation	23	20	96	55	85	35
Double amputation	12	11	15	8	31	13

* No amputation, 50 per cent; single amputation, 39 per cent, and double amputation, 11 per cent.

2. Buerger's disease is confined to males and involves younger patients than does arteriosclerosis.

3. The duration of symptoms prior to admission to the hospital is longer in Buerger's disease than in arteriosclerosis.

4. The five year life expectancy following successful major amputation is four times greater for patients with Buerger's disease than for those with arteriosclerosis.

5. An open lesion associated with Buerger's disease is invariably extremely painful, whereas pain is a far less striking factor in similar lesions with an arteriosclerotic basis, especially if associated with diabetes mellitus.

MAJOR AMPUTATION

Incidence.—As one would expect in the light of the fundamental differences already referred to, major amputations are necessary in far fewer cases of Buerger's disease than of arteriosclerosis (table 2). However, the proportion of patients coming to amputation

From the Peripheral Vascular Clinic of the Massachusetts General Hospital.

Read before the Section on Surgery, General and Abdominal, at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 18, 1939.

Mrs. Eunice Wilson and Miss Katherine Foster of the House Social Service Department assisted in securing follow-up data on the resulting function in these cases.

1. McKittrick, L. S.: Diagnosis and Management of Chronic Obliterative Vascular Disease, this issue, p. 1223.

2. Allen, Arthur W.: The General Management of Circulatory Disturbances of the Extremities, New England J. Med. **204**: 859-862, 1931.

3. McKittrick, L. S.: Indications for Amputation in Progressive Arterial Obliteration of the Lower Extremities, Ann. Surg. **102**: 342-350 (Sept.) 1935.

who require bilateral procedures is strikingly higher for Buerger's disease than for arteriosclerosis.

For the arteriosclerotic patients without diabetes the incidence of amputation was relatively high, but the proportion of patients with both extremities subjected to amputation was low as compared with the patients in whom diabetes mellitus was an associated condition. This is explained in part by the fact that among diabetic patients there are many with a favorable prognosis whose problem is primarily one of sepsis in a foot with good circulation, whereas in arteriosclerotic patients the circulation is almost invariably poor. When diabetes and advanced arteriosclerosis coexist, the presence of the diabetes increases the probability that the remaining extremity will have to be sacrificed.

TABLE 3.—*Incidence of Preliminary Open and Primary Closed Major Amputations, 530 Cases**

	Thrombo-Angiitis Obliterans		Arterio-sclerosis		Arteriosclerosis and Diabetes	
	No.	%	No.	%	No.	%
No major amputation	77	69	65	37	126	52
Preliminary open amputation	7	6	20	11	25	10
Primary closed amputation	28	25	91	52	91	38

* No amputation, 50 per cent; preliminary open amputation, 10 per cent, and primary closed amputation, 40 per cent.

The average interval between operations on the two sides in bilateral amputations was forty-three months for the patients with thrombo-angiitis obliterans, twenty months for the arteriosclerotic patients and twenty-five months for the diabetic patients.

The most important single factor in the lowering of the incidence of major amputations for patients with Buerger's disease during the period studied was the introduction into our clinic of sensory nerve block by Smithwick and White.[4] This procedure is most suitable for patients with thrombo-angiitis obliterans who present open painful lesions, and by employing it for 27 per cent of such patients we have reduced our incidence of major amputations from 74 to 31 per cent for patients with thrombo-angiitis obliterans.

Types.—It is all important at the onset of this discussion to point out the clearcut distinction between a guillotine, or preliminary open operation, and a closed undrained type of amputation. The former was carried out as a simple circular procedure in fifty-two instances in which we felt that the life of the patient was seriously jeopardized by the presence of infection in the extremity. In all save three of these the site of operation was through the lower part of the leg, and no attempt was made to modify in any way the simplest possible procedure lest the very purpose of ridding the patient of his infection be defeated by a further spread of the sepsis.

The midportion just distal to the main bulk of the gastrocnemius muscle was selected as the site of choice for this procedure, but when the streaks of lymphangitis extended above this level the open amputation was usually done in the upper third of the lower part of the leg. It is desirable to carry out the operation above the level of demonstrable lymphatic involvement, but if a pulsation is present in the popliteal artery of a relatively active person this consideration may be disregarded in order to leave enough of the lower part of the leg to permit the carrying out of a Gritti-Stokes amputation as a secondary procedure.

Vertical 1 inch incisions through the fascia were carried up from the site of operation to prevent any tendency toward limitation of the drainage by stenosis of cicatricial tissue at the end of the stump. The application of a ham splint and some form of ointment dressing has been found to give the patient the maximum amount of comfort after this type of procedure, although in certain instances the use of diluted solution of sodium hypochlorite has been deemed advisable.

A secondary closed amputation at a higher level was always contemplated and was carried out in 84 per cent of our patients who survived the guillotine procedure. We now feel that this secondary operation can usually be carried out approximately three weeks after the initial operation. We feel that the type of preliminary open amputation advocated here assures the extremely ill patient of the best chance of surviving but, even with subsequent plastic operations, does not result in a satisfactory stump.

The success or failure of a guillotine amputation in combating infection as a rule is evident from the clinical chart within forty-eight hours by a return of the elevated temperature to an essentially persistent normal level, as shown in the accompanying chart. In those cases in which hemolytic streptococci persist in the granulations of the open amputation, an initial course of sulfanilamide therapy is employed to rid the wound of these organisms and the drug is given three days before and after the secondary operation to protect the patient against reactivation of the infection.

An open amputation was done as a preliminary procedure in 10 per cent of the entire series of cases, the incidence of the procedure being approximately one half as great for the patients with Buerger's disease as for those with arteriosclerosis (table 3).

A closed amputation was carried out as a primary procedure in 40 per cent of the total number of cases.

It is our belief that with meticulous hemostasis in the types of amputation we advocate, drains serve only as a source of irritation and potential infection, and in only five instances were the wounds drained; this is in contrast to the use of drains in 72 per cent of the major amputations done from 1916 to 1926 at this hospital and reported by Wilson.[5] The hospital mortality in the cases of progressive obliterative disease in the earlier period was 24 per cent, and we feel from a study of the figures that the avoidance of drains in the present series ranks close to the advent of insulin as a factor in reducing our present mortality to 13.1 per cent.

TABLE 4.—*Distribution of Primary Closed Amputations at Various Levels, 200 Amputations*

	Thrombo-Angiitis Obliterans		Arterio-sclerosis		Arteriosclerosis and Diabetes	
	No.	%	No.	%	No.	%
Lower part of the leg	6	13	4	3	7	5
Gritti-Stokes	28	62	25	21	41	32
Low thigh	11	25	88	74	85	63
High thigh	0	0	2	2	0	0

We fully realize the functional advantages of preserving the knee joint, but it has been our experience that when the underlying pathologic process is of a progres-

4. Smithwick, R. H., and White, J. C.: Elimination of Pain in Obliterative Vascular Diseases of the Lower Extremity, Surg., Gynec. & Obst. **51**: 394-403 (Sept.) 1930; Peripheral Nerve Block in Obliterative Vascular Disease of the Lower Extremity, ibid. **69**: 1106-1114 (June) 1935.

5. Wilson, P. D.: Amputations, in Nelson Loose-Leaf Living Surgery, New York, Thomas Nelson & Sons, 1927, vol. 3, pp. 563-694.

sive nature, amputation at the lower part of the leg does not prove permanently successful. Even with thrombo-angiitis obliterans accompanied by a palpable pulsation of the popliteal artery, for which the prognosis is the most favorable, a second amputation at a higher level was eventually necessary in 75 per cent of the cases in which our enthusiasm to save the joint led us to carry out as the original procedure an operation on the lower part of the leg.

In no instance in which an amputation at or above the knee was carried out was it necessary to reamputate because of circulatory difficulty in the end of the stump.

It is our feeling that the Gritti-Stokes type of operation provides the most suitable weight bearing stump for patients whose general condition and underlying pathologic process render the prognosis favorable for a future of economic usefulness.

Since the outlook for continued years of activity is so much greater for patients with thrombo-angiitis obliterans than for arteriosclerotic patients, it is not surprising that the incidence of Gritti-Stokes amputations in the former group (62 per cent) was more than twice that for the older patients (21 to 32 per cent), as shown in table 4. Another factor in our preference for this type of procedure for patients with Buerger's disease and our apparent reluctance to adopt it for arteriosclerotic patients is the fact that the former patients will tolerate a complicated technical procedure infinitely better than the latter. That the Gritti-Stokes operation lays a greater demand on the general resistance and local process of repair is suggested by the fact that 68 per cent of the total number of patients submitted to this type of amputation have shown either a postoperative rise of at least 2 degrees Fahrenheit or an increase in the pulse rate of more than thirty points, whereas only 44 per cent of those submitted to a thigh amputation have done so. This observation has not been colored by either the length of operation or the choice of anesthetic, for the duration of each type of procedure has averaged almost exactly one hour, and spinal anesthesia has been used for 91 per cent of all our major amputations regardless of operative technic.

The absence of a popliteal pulsation does not per se contraindicate the use of the Gritti-Stokes type of amputation, for the potentially rich collateral circulation about the knee joint frequently more than compensates for occlusion of the main vessel. In twelve instances in which this operation was carried out, it was specifically noted that no pulsation could be made out in the popliteal artery, but under this circumstance this procedure should never be carried out if color changes in the skin denoting a precarious collateral circulation are noted at or above the ankle when the foot is in the dependent position.

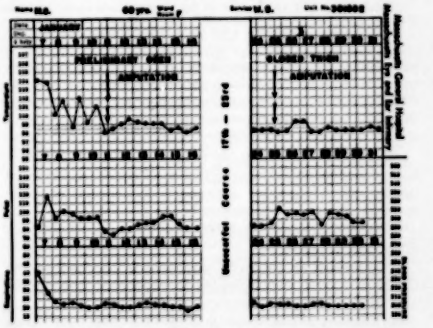
A thigh amputation done with a simple circular incision and division of the fascia and bone at progressively higher levels to permit closure of the layers without drainage is the safest closed major amputation of an extremity to which the patient can be subjected. For this reason it should be the procedure of choice for patients whose general condition is so poor that there is little hope of their using a prosthesis and for whom the chief aim of operation is removal of the distal portion of an extremity which is hopelessly involved in infection or gangrene. This situation was more frequently seen with arteriosclerosis, and consequently the incidence of thigh amputations for this condition was more than two and one-half times that for thrombo-angiitis obliterans, with its more favorable prognosis. We have found that this procedure is attended with less postoperative reaction than any of the other types of major amputation we have employed, and we have had only one instance of shock following it.

The lower portion of the thigh, just above the patella, is a more desirable site for such an amputation than the more bulky level of the upper or middle part of the thigh, and in only two instances have we been forced by potential infection and inordinately poor blood supply to operate at the higher site.

Although in many of the more recent thigh amputations we have done a tendoplastic type of operation, we never employ long skin flaps such as those advocated by Callendar,[6] as we believe that in extremities such as those under consideration the circulation in these flaps is apt to be too precarious to insure primary healing.

Indications for Preliminary Open Major Amputations.—We recognize the following as the indications for carrying out a guillotine type of operation through the lower part of the leg:

1. Progressive ascending infection with signs of extending lymphangitis at or above the ankle.



Clinical course in a case of nondiabetic arteriosclerosis with persisting infection of the foot and extending lymphangitis of the lower part of the leg.

2. General manifestations of persisting, overwhelming infection arising from a septic extremity, with an elevation of temperature over 103 F.

An appreciation of the fundamental differences between and the behavior of the three types of progressive arterial disease under discussion is of vital importance in determining how long a period of observation and conservative treatment is justifiable. In Buerger's disease an infectious process tends to remain confined to the foot, whereas in arteriosclerosis, especially when diabetes mellitus is present as an associated factor, a rapid, extensive spread by way of the lymphatics and blood stream is not uncommon.

That the presence of diabetes, even though under control, provides a very real added hazard cannot be overstressed, and it is especially important with this condition that no undue optimism be allowed to influence a rigid adherence to the indications for operation already noted. The diabetic patient with spreading infection or overwhelming sepsis represents both a medical and a surgical emergency, and delay in the

6. Callendar, C. L.: Tendoplastic Amputation Through the Femur at the Knee, J. A. M. A. **110**: 113-118 (Jan. 14) 1938.

adoption of surgical intervention as the method of treatment is rarely justifiable, whereas a period of twelve hours of observation may be adopted for patients with arteriosclerosis unassociated with diabetes, and an interval of twenty-four hours may be utilized with equal safety for patients with thrombo-angiitis obliterans.

Naturally no arbitrary stipulations can be formulated to cover all conditions, and the surgeon should consider it his responsibility to keep in such close contact with this type of case that he will be ready to operate without delay at any time when the infection gives evidence of extending despite conservative measures. If improvement of the septic process is noted at successive periods of observation, conservative treatment may be continued until the lesion has regressed to the quiescent state in which the criteria for primary closed amputations apply.

TABLE 5.—*Operative Mortality* for Major Amputations, 262 Cases, 13.1 per Cent†*

	Thrombo-Angiitis Obliterans		Arterio-sclerosis		Arteriosclerosis and Diabetes	
	No. of Deaths	%	No. of Deaths	%	No. of Deaths	%
Preliminary open amputation	0	0	5	25	8‡	32
Primary closed amputation	1	4	10	11	10	11
Total	1	3	15	14	18	16

* Two deaths, one following gastric resection and one following hysterectomy, are not included in the deaths.

† Preliminary open amputation, 25 per cent; primary closed amputation, 9.6 per cent.

‡ One of these patients died after the secondary closed amputation.

Indications for Primary Closed Amputations.—We have come to believe that in a case of peripheral arterial disease the following represent the indications for primary closed major amputations:

1. Infection or gangrene in a pulseless foot involving all of one or more toes.

2. Infection or gangrene proximal to the base of the digits in a foot with palpable arteries that under conservative treatment continues to extend.

3. The involvement by infection or gangrene of so much tissue that any so-called successful treatment will consume a major part of an individual's life expectancy or result in a functionally useless extremity.

4. The persistence of pain either in the presence or in the absence of an open lesion which cannot be controlled within a three weeks period of hospital care and adequate conservative treatment.

5. A history of repeated incapacitating ulcerations of an extremity on which all conservative measures compatible with the status of the circulation have been carried out.

These indications must be interpreted according to the underlying pathologic process because of the marked difference in economic potentialities and resistance to infection that exists between patients with thrombo-angiitis obliterans and those with arteriosclerosis. It is especially true of the former patients that an exception may be made to these stipulations if an adequate collateral circulation can be demonstrated by the persistence of a normal color of the skin of the extremity on elevation and dependence.

As patients for whom major amputation is contemplated are in no such precarious condition as those facing preliminary open amputation, a longer interval of study may be safely employed to evaluate their condition. Undue procrastination, however, is indefensible, especially when diabetes is present, and there can be no more glaring example of mismanagement than to be forced to do a guillotine operation on a patient who, at an earlier period of his hospital observation, presented clearcut indications for a closed procedure.

The fundamental differences between Buerger's disease and arteriosclerosis should be weighed in determining the level of amputation, and the arterial blood supply of the selected site should be sufficient not only to insure primary healing but also to maintain the end of the stump in normal condition under its anticipated demands.

In 12 per cent of the patients, sepsis of sufficient extent to prolong the hospital stay developed. Twenty-five patients with infection had undrained closed amputations, but of these only one died because of this complication. Seven patients on whom a preliminary open operation had been done showed extension of their sepsis at the site of the guillotine amputation, and of these two died as a result of this condition.

In only four of our earlier cases did we have to deal with a Bacillus welchii contamination despite the fact that we do not as a routine employ the prophylactic use of gas bacillus antitoxin. The patients who showed sepsis in their stump probably represented an error as much in the proper selection in the type and site of amputation as in the actual operative technic.

Mortality.—An important factor in any operative mortality is the degree to which the performance of the operation and the care of the patient are delegated to a limited number of persons. Although six surgeons of the visiting staff have maintained a continuous active interest in the clinic since its inception, a large number of the amputations have been carried out by the more recent additions to our group and by the frequently changing personnel of the house staff.

In determining the hospital mortality in this series of cases, with two exceptions, we attributed any death which occurred during the stay at the hospital in which the major amputation was done to the operation. One of the deaths excepted followed a laparotomy for carcinoma of the stomach and the second a hysterectomy carried out for a twisted pedunculated fibroid growth.

TABLE 6.—*Causes of Hospital Deaths, Thirty-Six Cases*

Pulmonary conditions	15
Cardiorenal conditions	7
Infections	6
Emboli	4
Miscellaneous	4

TABLE 7.—*Functional Results, 221 Cases*

	Thrombo-Angiitis Obliterans	Arterio-sclerosis	Arteriosclerosis and Diabetes
Prosthesis used, single amputation	88%	49%	53%
Prosthesis used, double amputation	6%	29%	33%

The hospital mortality for the 262 major amputations in this series was 13.1 per cent (table 5).

For the patients on whom it was necessary to do a preliminary open amputation the mortality would presumably have been staggeringly high without operative intervention, and we feel that with such extremely ill patients our hospital mortality of 25 per cent justifies our enthusiasm for the use of a guillotine procedure through the lower part of the leg.

The relative operative risk in the three subdivisions of the series is well illustrated by the fact that with preliminary open operations there were no deaths of patients with Buerger's disease, a 25 per cent mortality for the arteriosclerotic patients and a 32 per cent mortality for the diabetic group. It is interesting to note that only one of the patients who had a closed amputation secondary to a guillotine procedure died, and his death was not due to sepsis.

For the primary closed amputations the mortality was 9.6 per cent, with a figure of 4 per cent for the patients with Buerger's disease and 11 per cent for the arteriosclerotic groups.

Pulmonary complications, the majority of which were bronchopneumonia, accounted for the greatest number of deaths, with cardiac complications and infection next and of almost equal importance (table 6). In four of the six cases in which death was due to infection, it was the sepsis of the stump that was primarily responsible. Four patients died of emboli.

Function.—The ability of the patient to employ a prosthesis successfully does not depend solely on the level and condition of the amputation stump. His general mental and physical vigor, the care with which he is instructed in the use of his pylon and the condition of his remaining extremity are more important factors in his rehabilitation than the type of procedure that has been carried out.

It has been our practice to equip our patients with temporary limbs and give them at least a few days instruction in the use of these before they leave the hospital. Temporary limbs which are simple in construction and appearance are employed for the period of shrinkage of the stump and in many instances these are used indefinitely as a matter of choice by the patient. With a Gritti-Stokes or thigh amputation, a patient who cannot handle the rigid, full length type of appliance should be spared the mental and financial disappointment of being "graduated" to one of the knee action type of limbs.

Eighty-eight per cent of the patients with Buerger's disease who had a single amputation mastered the use of a prosthesis, as compared with approximately 50 per cent of the more elderly arteriosclerotic patients (table 7). Naturally there is a wide variation in the proficiency attained in the use of the pylons.

Every patient with thrombo-angiitis obliterans who had a single amputation secured some type of pylon, while almost exactly one fourth of both the arteriosclerotic and the diabetic patients who had a single amputation did not obtain any appliance for, with these segregated groups, the likelihood that a prosthesis would be used did not seem to warrant the financial outlay involved.

When bilateral amputations were carried out, two thirds of the patients with Buerger's disease used some form of artificial appliance. It is discouraging to find that with bilateral amputations it was deemed feasible to provide pylons for only one third of the arteriosclerotic and one half of the diabetic patients.

CONCLUSIONS

1. A guillotine amputation through the lower part of the leg for critically ill patients with ascending infection is indicated as a life-saving measure.

2. The open operation does not result in a satisfactory stump in cases of obliterative arterial disease and should be considered as a preliminary step to a secondary closed amputation at or above the knee.

3. A closed amputation through the lower part of the leg rarely proves permanently satisfactory in cases of advanced arterial obliterative disease.

4. The Gritti-Stokes amputation is the most satisfactory procedure for a patient with arterial disease whose general condition does not preclude the use of a prosthesis.

5. A simple low thigh operation is the safest major amputation of an extremity that can be carried out and is the procedure of choice for enfeebled patients for whom a major amputation is indicated.

6. Drains should never be used in primary closed amputations.

7. The decision as to the advisability and site of amputation should include due consideration of the nature of the underlying pathologic process, the future usefulness and life expectancy of the patient and the status of the peripheral circulation.

264 Beacon Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. TAYLOR AND FAXON

DR. LELAND S. MCKITTRICK, Boston: Our problem was not quite what Dr. Taylor faced, because one of our seniors, the late Dr. D. F. Jones, had gone a long way toward teaching us the fundamental principles in the management of this group of cases. May I stress one of the points that he has made, and that is the importance of cooperation between the surgeon and the physician; not only must there be cooperation, but if the surgeon is not interested in vascular disease, if he does not want to give the detailed attention necessary to the diabetic patient with gangrene, he ought not to take the responsibility. Therefore the cooperation must be between interested people. With regard to where and how to amputate, it seems to me that there are two or three decisions that we must make. We must decide in our own minds (1) what is the safest amputation I can do in the presence of extending infection, (2) what is the safest closed amputation I can do and (3) what is the best amputation for this particular patient. As Dr. Taylor said, if one is facing probable fatality, one had better not worry what is the best amputation but rather try to save the patient's life. I believe that the safest amputation to do in the presence of fulminating, overwhelming infection is a guillotine amputation, in most instances done below the knee. I nearly always do a reamputation at a higher level when the condition of the stump and the condition of the patient permit. There seems to be no definite agreement as to the safest closed amputation. Callander feels that it is his modification of the Gritti-Stokes procedure. Smith of New York will say that it is his operation below the knee. For me and for the members of the Peripheral Vascular Clinic at the Massachusetts General Hospital the safest closed operation is a supracondylar amputation. Operation should be done without a tourniquet. A circular incision is used. Nothing which touches the skin is allowed to touch the inside of the wound, and the wound is closed without drainage. We have obtained primary wound healing in 93 per cent of our cases, and in only 2 per cent of 100 consecutive cases was stump sepsis a factor in death. I should like to point out that in the group reported by Dr. Faxon a very high percentage of the amputations were done by our surgical resident staff—men of immature experience, just beginning to learn their surgical technic—but they had been told when to operate and where to amputate. In other words, if one can make up one's mind early to do an amputation when it is indicated, whether to do an open amputation below the knee or a closed amputation above the knee, I believe that the results will be just as good as Dr. Faxon's or Dr. McKittrick's.

DR. GEZA DE TAKATS, Chicago: I should like to state briefly my experience with the Callander type of amputation. This type of amputation does not cut through muscles but cuts through tendon insertions; adequate drainage can be procured for four or five days. In thirty-five amputations our mortality has been 11 per cent. In a comparative group of sixty-five

patients on whom lower thigh amputations have been performed the mortality was 27 per cent. This series, of course, is very small. One is, however, impressed with the fact that, while one can maintain free drainage for four or five days, the clips are then applied and an excellent weight bearing stump can be obtained without reamputation. We have had unfortunate experiences with gas gangrene following amputations, even in patients receiving from two to four prophylactic doses of antitoxin, and I should like to ask both Dr. Faxon and Dr. Taylor whether or not they have had any gas gangrene in their series. As to the level of the amputation, I believe that in addition to the palpation of pulses and the sudden drop in skin temperature the study of cutaneous histamine flares is a very exact guide to the level at which a skin flap will take.

DR. HENRY H. FAXON, Boston: As regards the question of gas bacillus infection, it is of interest to note that the four cases presenting this complication were all early in our series, the last one occurring in 1931. I do not employ gas bacillus antitoxin as a routine measure for I feel that skin contamination is the primary source of such infection and that with proper preparation of the extremity for operation this complication should not occur. In recent years I have laid special emphasis on the fact that the involved distal portion of the extremity should be completely isolated by a separate dressing from the site of amputation. The preoperative preparation should not encroach on the area of apparently normal skin adjacent to the infection, and only the gentlest cleansing of the skin at the site of operation is permitted. I feel that these steps have played a major part in reducing the incidence of gas bacillus infection and that no preoperative preparation of the extremity is far more desirable than one that carries with it the risk of transmitting Bacillus welchii into the operative field.

THE VALUE OF EARLY OPERATION IN CHRONIC PRIMARY GLAUCOMA

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There seems to be a considerable difference of opinion among ophthalmologists regarding the tractability of chronic primary glaucoma to operative treatment. There are those who believe that the disease can be arrested in most cases by well chosen and well executed operation when indicated, and there are others who take a much less optimistic view.

Judgment in the choice of the operation and the technic employed do not seem to be the most important factors in this difference of opinion; it rests rather on the time in the course of the disease at which the operation is performed. My own observations have inclined me to the opinion of those ophthalmologists who hold that primary glaucoma is relatively tractable if the patient is operated on in the early stages of the disease when an operation is indicated and relatively intractable if the operation is deferred until the disease has advanced.

In an effort to establish this belief on a more certain footing, I have studied a series of 105 selected cases (153 eyes) of chronic primary glaucoma [1] in which a trephine operation was performed. The fields of vision and blind spots, together with tonometric readings, were recorded before the operation and again repeatedly after the operation for an average follow-up period of over four years. In many instances observations made on gonioscopic examinations were available. All cases in the following categories were excluded from the series:

1. Primary glaucoma in Negroes, because the disease is notoriously intractable in this race.
2. Primary glaucoma in eyes later subjected to cataract extractions, which complicated postoperative follow-up studies.
3. Cases not followed over a sufficient period of time after operation.
4. Cases presenting incomplete perimetric and tonometric determinations before or after the operation.
5. Incipient or chronic cases which were made acute by the use of mydriatics.
6. Cases in which any question of secondary glaucoma has arisen.
7. Cases in which there was any question of defective operative technic and in which any postoperative complication seemed to influence the result.

These 105 cases of chronic primary glaucoma, selected in accordance with the foregoing stipulations, were divided arbitrarily into so-called early and so-called advanced cases.

The early cases were considered to be those in which the peripheral fields had not contracted to a point closer than 30 degrees of fixation in any meridian and in which the blind spots were not larger than 15 degrees in any diameter. It follows that the advanced cases comprised those in which the peripheral fields had contracted in any meridian to closer than 30 degrees of fixation and in which the blind spots were enlarged more than 15 degrees.

The presence or absence of a cupping of the optic disk could not be used satisfactorily as a criterion in classifying these cases. It can only be said that the majority of the so-called advanced cases presented cupping. Cupping was rare in the early cases and when present seemed to be an unfavorable sign.

The early cases examined with the gonioscope showed mostly open filtration angles, while the late cases showed the angles closed, either in part or entirely, by peripheral synechiae. Many of the eyes were not examined with the gonioscope.

EARLY CASES

There were fifty-one eyes classified as early glaucoma at the time of operation. Of these, forty-six, or more than 90 per cent, showed arrested disease after an average follow-up of approximately five years from operation. The intra-ocular tension taken on many occasions during this period was always normal except in six instances, in which once or several times it was found to be as high as from 30 to 35 mm. of mercury with the Schiötz tonometer. The peripheral fields showed no further contraction, and in only eight cases was there any progressive enlargement of the blind spots (to an average of only 6 degrees). In only two cases was more than one operation performed; one of these showed a progressive contraction of the fields and will be discussed later; the other showed no progression and the tension was reduced to normal for the remainder of the follow-up period after the second operation.

The five cases in which operation failed to check progressive contraction of the peripheral fields or to control the intra-ocular tension will be taken up briefly:

1. Two operations were performed in this case and the intra-ocular pressure following each ranged from 30 to 45 mm. of mercury with the Schiötz tonometer. There were indications for still another operation, as the pressure was not controlled. The fields showed progressive contraction, and central vision was lost. Before the second operation the fields showed a nasal step and a 10 degree enlargement of the blind spot,

From the Eye Institute.
Read before the Section on Ophthalmology at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 17, 1939.

1. These include both chronic noncongestive or simple glaucoma and congestive glaucoma, as I believe that in the present state of our knowledge we must consider them the same disease, producing congestive manifestations or not, according to the degree of the tension and the duration of time required for the vascular system of the eye to adjust itself to the increased tension.

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which would probably put this case in the advanced group at the time the second operation was done. The gonioscopic examination revealed that ciliary processes were caught in the trephine opening, a factor which probably had an unfavorable influence on the drainage. The possibility that this was a case of secondary glaucoma must be considered: the slit lamp showed some synechiae and some nebulous folds in Descemet's membrane but no deposits on the cornea and no cells in the aqueous.

2. In this case another operation should have been performed, as the tension was obviously not controlled by the first one. It ranged from 25 to 33 mm. of mercury. The nerve head showed a definite cupping.

3. This case might also have been arrested had another operation been done, because the tension ranged from normal to 33. There was a deep cupping of the optic nerve.

4. This was a case on the borderline between early and advanced, as the fields before operation were 30 degrees from fixation in one meridian. The tension was not satisfactorily controlled, as it ranged from normal to 35. Another operation could possibly have prevented progression.

5. The tension in this case was also not controlled; it ranged from normal to 35.

ADVANCED CASES

There were 102 eyes classified as late cases. Of these, sixty-five showed progressive contraction of the visual fields following operation. Three showed improvement, followed later by contraction, and in nine cases the fields were so telescopic that it was difficult to determine the question of progressive contraction; it could only be surmised on the ground that central vision was lost.[2] Of the 102 eyes there were twelve in which the fields of vision had contracted beyond fixation, with loss of central vision before operation, so that it was difficult to determine the question of progression after operation. Of the remaining ninety eyes, sixty-five, or 72 per cent, showed progressive contraction of the fields following operation during an average follow-up period of over five years. Of these sixty-five eyes in which the fields progressively contracted, thirty-nine, or 60 per cent, had normal intra-ocular tension at numerous times over the average follow-up period and at no time was the intra-ocular pressure found to be above normal.

COMMENT

The operation done in the early cases successfully reduced the intra-ocular pressure to normal, where it remained during the four years and two months average follow-up period in more than 90 per cent of the cases. This percentage is not surprising when certain facts about primary glaucoma are considered. In the early stages there are no peripheral synechiae; but if the glaucomatous state is not relieved and exists long enough peripheral synechiae develop, increase in extent, ultimately occupy the entire circumference of the filtration angle and also increase progressively in breadth. It can therefore be said that peripheral synechiae do not cause glaucoma but that glaucoma causes anterior peripheral synechiae which in turn cause glaucoma. Here is a vicious circle which is initiated by the unknown factor in glaucoma. If a filtering operation is done while the filtration angle is still open, then the filtration load, which must be borne by the operation, is less than when the angle is closed over a portion or over its entire circumference.

Furthermore, if the filtration furnished by the operation is adequate to keep the intra-ocular pressure within normal limits, no further blocking of the angle by synechiae will occur and therefore, as time goes on, no additional burden will be placed on the filtration produced by the operation. This is true because an increase in the intra-ocular pressure per se produces peripheral synechiae. Witness the almost uniform presence of peripheral synechiae in the later stages of all types of glaucoma and the relation between the extent of the synechiae and the stage of advancement of the disease. Peripheral synechiae develop ultimately not only in primary glaucoma but in secondary glaucoma due to whatever cause. It is my belief that even in glaucoma of the deep chamber type peripheral synechiae develop if the intra-ocular pressure is elevated over a sufficiently protracted period. It seems, therefore, that an increase in the intra-ocular pressure per se, from whatever cause, produces anterior synechiae, and it follows that an early lowering of the intra-ocular pressure to normal prevents their occurrence and in so doing prevents an additional drainage load on the operation.

Of the late cases there were thirty-nine eyes out of sixty-five, or 60 per cent, which showed progressive contraction of the visual fields in spite of the fact that the intra-ocular pressure had been reduced to normal over the five year follow-up period following the operation. This would indicate that if the vascular changes occasioned in the retinal vessels by the increased intra-ocular pressure producing the peripheral field contraction have reached a certain degree or have gathered a certain momentum, so to speak, they continue to progress, thus producing progressive field defects in spite of normal intra-ocular pressure. This fact is also a strong argument in favor of operating early in cases of primary glaucoma, before this vascular process gathers sufficient momentum to progress regardless of the successful reduction of the intra-ocular pressure.

The results of this analysis show that chronic primary glaucoma is quite a tractable disease if the operation when indicated is done in the early stages. This is not possible in some instances because the patients do not present themselves for treatment until the disease has already made inroads, a tendency rising from the fact that the disease frequently has an insidious course with few symptoms. The ophthalmologist is familiar with even intelligent patients who, without realizing it, have practically lost the vision in one eye from glaucoma. General practitioners and the lay public should therefore be familiar with the cardinal symptoms of glaucoma so that patients may present themselves for diagnosis early enough to arrest the disease. The same importance should attach to the early recognition of and the early operation when indicated for glaucoma as is generally conceded for cancer. By the same token the ophthalmologist should be able to detect glaucoma in its earliest stages and even in its prodromal stage in many instances. This can be done only by the frequent use of the tonometer and by constantly suspecting glaucoma, particularly in predisposed eyes such as those with hyperopia and with shallow anterior chambers. If the diagnosis is not made until there is cupping of the optic disk, usually the disease has advanced too far to be arrested.

As soon as it has been established that the intra-ocular pressure in a case of primary glaucoma cannot be controlled by miotics, an operation is indicated.[3] An

2. Twenty-five eyes among the advanced cases showed progressive constriction of the visual fields to the point of so-called telescopic fields and then showed no further progression over the follow-up period. This central field remained in twelve instances in spite of the fact that the intra-ocular pressure remained above normal. In ten of the twenty-five eyes the patients retained central vision and five of these even showed an increased intra-ocular pressure over the follow-up period. The explanation for this seems to be that in some eyes the macular region receives sufficient nutrition from the underlying choroid to enable it to function independently of the retinal blood supply altered by the glaucoma.

3. De Wecker said "If miotics have never cured a case of glaucoma, they have prevented many glaucomatous patients from being cured."

exception to this is the patient whose intra-ocular tension is somewhat above normal, even with the strongest miotics that can be used as a routine, but who has an expectancy, whether because of age or of poor health, which makes it justifiable to temporize with the idea that the vision will probably outlast the patient. An operation is also indicated when, with the use of miotics, the intra-ocular pressure is normal or near normal when it is measured but the visual fields continue to contract, the blind spots to enlarge and peripheral synechiae to form, all evidence that the tension is appreciably elevated at times when the patient is not under observation.

When the indications point toward an operation, no time should be lost in advising and even insisting on it. Quite frequently the patient, the physician, or both, tend to procrastinate. This is not surprising when we consider the fact that we are dealing frequently with a highstrung, nervous, apprehensive individual to whom we advise an operation on an eye usually with normal vision and often giving no symptoms. We promise this patient no tangible result as we do in squint and cataract cases. We can only state that we hope to save the vision for the future.

Too frequently the operation is deferred until the disease has advanced to the point at which the chances of arresting the process are slight. Then repeated operations are done in quick succession, all in vain, and glaucoma is branded a most intractable disease. For the best results the operation should be done before there is enlargement of the blind spots and constriction of the fields, and certainly before there is any cupping of the disk. When this desideratum is fulfilled, chronic primary glaucoma ceases to be one of the terrors of ophthalmology.

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ABSTRACT OF DISCUSSION

DR. HARRY S. GRADLE, Chicago: The conclusions that Dr. Reese so ably presented should be spread broadcast not only to cure the intolerable pessimism of many of our colleagues regarding glaucoma but to urge those with glaucoma to seek attention early. The classification of the cases into the early and the late is most proper. There is no question that a late case of compensated glaucoma with the classic appearance of the cupped disk and the extensive field changes is a surgical case immediately; but there are many early cases that we are finding now, thanks to the better diagnostic methods, more commonly than we did in the past. I do not believe that Dr. Reese emphasized sufficiently the fact that early operation is desirable when it is indicated. It is true that, if the disease cannot be controlled by other than surgical methods, temporizing is to be avoided and early operation will produce the results that Dr. Reese has shown. But there must be definite indications for surgical intervention and we are not justified in operating in early cases of compensated glaucoma until we are sure that they cannot be controlled by nonsurgical treatment. We cannot be sure of the lack of control by nonsurgical treatment until a good many weeks or even a good many months have elapsed. We cannot be sure of lack of control if we depend entirely on the tonometric measure of intra-ocular pressure. We may obtain a given level of intra-ocular pressure that can be held by miotics, but whether that intra-ocular pressure is pathologically high for the eye in question can be determined only when the effects on the visual field and the central visual acuity have been determined. Those effects are slow in making their appearance and we must not judge too hastily. Therefore I am trying to stress the necessity of strenuous indications for surgery; but when surgery is indicated, then Dr. Reese is correct; nothing should be allowed to interfere with the immediate performance of such an operation.

INFECTIOUS RELAPSE IN SYPHILIS OF MORE THAN TWO YEARS' DURATION

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The importance of infectious relapse in early syphilis has been discussed by many observers.[1] In the Cooperative Clinical Group studies [2] of 339 cases of mucocutaneous relapse, 84 per cent occurred within the first two years of infection and 91 per cent within two years after treatment had ceased. These figures correspond closely to those of Stokes, Besancon and Schoch,[1] who noted 93 per cent of their relapses by the end of the second year of infection, and those of Rosahn,[3] who recorded 86.7 per cent over a similar period of time in inadequately treated patients.

Although infectious relapse is largely a phenomenon of the first two years of infection, a not insignificant number of instances of relapse after two years have been reported. Stokes, Besancon and Schoch [1] cited a case of infectious recurrence in the mouth six years after onset of the disease, and of the finger nine years after the initial lesion. Nielson [4] recorded the finding of Spirochaeta pallida in lesions that appeared nine years after infection. Hudelo and Rabut [5] cited two cases of infectious lesions six and seven years respectively after the onset of the disease. Cassar [7] observed a monorecedive or recurrent chancre three years after the appearance of the original chancre. In the Cooperative Clinical Group material of 5,952 cases there were thirty-three instances of infectious relapse occurring from three to seven years after the infection, and eight instances after more than seven years' duration of the disease.[8]

Within a relatively short period, from July 1, 1937, to Dec. 31, 1938, six cases of infectious relapse occurring two and a half or more years after onset of infection were noted in a rather small group of 120 cases, an incidence of 5 per cent. These patients included a group previously diagnosed as having primary and secondary syphilis who for the most part were urged through active solicitation by the social service staff to return to the Syphilis Clinic of the Hospital of the University of Pennsylvania for reexamination. Only patients whose infection was of two or more years' duration were included in this study. Two of the six cases discovered in this series will be reviewed as representative of this type of late relapse:

From the Department of Dermatology and Syphilology, University of Pennsylvania School of Medicine, and the Institute for the Control of Syphilis, John H. Stokes, M.D., Director.

1. Stokes, J. H.; Besancon, J. H., and Schoch, A. G.: Infectious Recurrence and Mucocutaneous Relapse in Syphilis, J.A.M.A. **96**: 344 (Jan. 31) 1931. Moore, J. E., and Kemp, J.: The Treatment of Early Syphilis; Clinical Results in 420 Patients; The Wassermann Reaction in Treated Early Syphilis, Bull. Johns Hopkins Hosp. **39**: 16 (July) 1926. Stokes, Cole, Moore, O'Leary, Wile, Parran and Usilton.[2]

2. Stokes, J. H.; Cole, H. N.; Moore, J. E.; O'Leary, P. A.; Wile, U. J., Parran, Thomas, Jr., and Usilton, Lida J.: Cooperative Clinical Studies in the Treatment of Syphilis; Early Syphilis, Ven. Dis. Inform. **13**: 233 (July) 1932.

3. Rosahn, P. D.: Inadequate Treatment of Early Syphilis; Clinical Results in 409 Patients, Am. J. M. Sc. **193**: 534 (April) 1937.

4. Nielson, L.: Papulo-erosive Syphilide in Mund und Schlund mit Nachweisung von Spirochaete pallida ungefähr neun Jahre nach Infektion, Monatsh. f. prakt. Dermat. **48**: 53 (Jan.) 1909.

5. Hudelo, L., and Rabut: Récidives, secondaires et accidents chancriformes chez les syphilitiques traités, Presse méd. **32**: 740 (Sept.) 1924.

6. Footnote deleted on proof.

7. Cassar, A.: A propos d'un cas remarquable de pseudo-réinfection syphilitique, Ann. de dermat. et syph. **6**: 376, 1916.

8. Quoted by Stokes, J. H.: Modern Clinical Syphilology, Philadelphia, W. B. Saunders Company, 1934, p. 713.

REPORT OF CASES

CASE 1.—P. D., a white man, was first seen in the Syphilis Clinic of the Hospital of the University of Pennsylvania Feb. 2, 1928, at the age of 21. A diagnosis of seropositive primary syphilis was made. After he had received seven injections of arsphenamine (3.1 Gm.) and two injections of bismuth arsphenamine sulfonate (bismarsen) (0.4 Gm.) irregularly over a period of ten months, he disappeared from observation for twenty-one months. He reappeared in September 1930 with dark field positive penile lesions. Treatment was again instituted. However, after only two injections of neoarsphenamine (0.75 Gm.) and three injections of bismuth subsalicylate (0.36 Gm.) he again lapsed from observation. In November 1932, twenty-six months after the first relapse, he returned with another dark field positive penile lesion. He was given nine injections of trisodium arsphenamine sulfonate (3.9 Gm.)[9] and nine injections of bismuth subsalicylate (1.2 Gm.) over a period of two months, only to disappear again from observation. Five months after his last injection he again made his appearance in the clinic with a penile lesion. He received trisodium arsphenamine sulfonate ten injections (4.8 Gm.) and bismuth subsalicylate ten injections (1.2 Gm.) irregularly over a period of six months. After a lapse of four months he returned in April 1934 with another dark field positive penile lesion. As the result of repeated urgings and many visits, he was kept under treatment until March 1936, almost two years, receiving during this time twenty injections of trisodium arsphenamine sulfonate (10.4 Gm.) and twenty-six injections of bismuth subsalicylate (3.12 Gm.) irregularly, plus nonspecific therapy with aolan, fuadin and antimony and potassium tartrate.

In November 1938, ten years and nine months after the infection was first discovered and after a lapse of thirty-one months from his last treatment, he reappeared with dark field positive perianal condylomas and multiple penile indurated ulcers. He stated that he had had similar penile lesions recurrently during this last lapse.

Serologic tests of the blood for syphilis were about as irregular as his clinic attendance. They tended toward early reversal with treatment and toward frequent serologic relapses both during treatment and during lapse of treatment. An examination of the spinal fluid performed in January 1936 gave negative results.

CASE 2.—V. H., a Negro woman aged 23, was first seen in the clinic in June 1932 with perianal condylomas positive under dark field examination. Serologic tests for syphilis were strongly positive on admission, reversed after the sixth week of treatment and relapsed at frequent intervals.

From June 1932 to March 1934 the patient received forty-four injections of trisodium arsphenamine sulfonate (23.4 Gm.) and thirty-five injections of bismuth subsalicylate (4.2 Gm.) quite regularly, followed by ten injections of bismuth subsalicylate (1.20 Gm.) irregularly to February 1935. In February 1936 she reappeared, stating that she had had a "boil" on the vulva which had been cauterized by a private physician to whom she applied for treatment because of abdominal pains. Dark field examination of this cauterized lesion was negative.

In October 1938, six years and four months after her original infection, she again appeared with two small, slightly indurated papular, dark field positive erosions of the labia. She stated at that time that she had noticed "sores" on the vulva on several occasions during lapse from treatment but had not sought aid because they did not bother her. These observed lesions were associated with a serologic relapse; the spinal fluid examination was negative in February 1933.

COMMENT

Infectious recurring lesions appeared in the other four cases from two and one-half to four years after onset of infection.

That the reported cases may represent reinfections is improbable, for not one of them fulfils even the less rigid criteria of probable (grade 2) reinfection as outlined by Stokes and his collaborators.[10] The second case reviewed perhaps more nearly falls into a borderline type which satisfies some of the criteria of probable reinfection. However, the occurrence periodically of moist vulvar lesions during the two years of lapse from observation points to infectious relapse rather than to reinfection. The patient was not asymptomatic for at least a year after treatment had been discontinued. This considerably weakens the argument in favor of reinfection. Although one cannot be certain that the lesions as observed by the patient were syphilitic, the probabilities favor this assumption, for the last crop of vulvar lesions, similar in characteristics to those observed by the patient, were found to contain Spirochaeta pallida.

Stokes and his collaborators [2] have shown that early mucocutaneous relapse occurred in 15 per cent of those who received nineteen or less injections of an arsenical and in only 2 per cent of those who received twenty or more injections. Twenty injections of an arsenical with corresponding amounts of heavy metal were regarded as the minimum needed to control the danger that the individual represented to his contacts and to the public. This was designated for statistical purposes as "adequate" treatment. The term "adequate" was by no means intended to be synonymous with sufficient or total treatment necessary but was merely used as a convenient designation for the division of material. It is in this sense that the term is used in the remainder of the paper.

Seventy-eight patients (65 per cent of this series) received, numerically speaking, "adequate" treatment. Five of the six relapses occurred in this group. This curious fact of higher proportion of relapse in the "adequately" as compared with the "inadequately" treated cases is due to the closer observation of the more cooperative "adequately" treated patient and to the fact that the prime relapsing period, the first two years, is excluded by our selection of material. Although the "adequately" treated patients tended to be under fairly close observation during the first two years of infection while under treatment and recent post-treatment observation, the "check-up" periods tended to become spaced further and further with time. The recorded incidence of infectious relapse of 5 per cent in syphilis of more than two years' duration therefore constitutes a minimum percentage. The actual incidence can only be surmised.

Two of the six patients were completely unaware of the existence of any lesions; a third ignored the perianal condylomas and regarded them as hemorrhoids. In other words, in one half of the total number of late relapsing cases the lesions appeared so unobtrusively that they were either unrecognized or minimized by the patient. It is probable, therefore, that these spirochete-containing, banal looking painless lesions may "come and go" more frequently than is generally recognized in ostensibly "late latent" syphilis.

Three of the five cases received "adequate" treatment irregularly. That irregular treatment is notorious in the production of infectious relapse has been noted by many observers (Hoffmann,[11] Gennerich,[12] Spence,[13]

9. Stokes, J. H., and Beerman, Herman: New Arsphenamine Synthetics in the Treatment of Syphilis: A Consideration of Test Procedure and of a New Drug (Triarsen), Arch. Dermat. & Syph. **35**:78 (Jan.) 1937.

10. Stokes, J. H.; Cole, H. N.; Moore, J. E.; O'Leary, P. A.; Parran, Thomas, Jr., and Wile, U. J.: Cutaneous and Mucosal Relapse in Early Syphilis and Its Differentiation from Reinfection, Ven. Dis. Inform. **12**:53 (Feb.) 1931.

11. Hoffmann, E.: Dauer der Kontagiosität der Syphilis und Ehekonsens im Lichte der neuen Forschung, Deutsche med. Wchnschr. **39**:15 (Jan.) 1913.

12. Gennerich, W. A.: Die bisherigen Erfolge der Salvarsan behandlung in Marinelazarett zu Wik, München. med. Wchnschr. **61**:313 (March) 1914.

13. Spence, H.: Recurrent Syphilide Simulating Reinfection, Proc. Roy. Soc. Med., Dermat. Sec. **9**:96 (March) 1915.

Frühwald,[14] Harrison,[15] Stokes and Usilton,[16] Dennie,[17] Rosahn,[3] Gaté,[18] Tzanck and Cord [19] and others). This type of treatment was very apparent in case 1, in which treatment at no time was regularly given for more than ten weeks. The patient suffered no less than five known infectious relapses in ten years. Irregularity in treatment, even though "adequate" from the standpoint of total number of injections, constitutes an important factor in increasing the incidence in this type of relapse.

In two of the six cases treatment was begun in the seropositive primary stage. This tendency toward mucocutaneous relapse in this stage has been shown by Stokes and his collaborators [20] to be higher than in any other corresponding stage of early syphilis. However, as has been pointed out in this Cooperative Clinical Group study, the physician's public health duty demands the earliest possible diagnosis as well as the earliest possible institution of treatment.

Four of six cases showed a tendency toward early serologic reversal; that is, seronegativity by the fourth to the seventh week of treatment. Two of these patients showed a tendency toward frequent serologic relapse. Moore and Kemp [1] have pointed out that, in those cases showing "prematurely negative" serologic reactions for syphilis in early infection, relapse of the infectious type is about five times more frequent than in the average case. It becomes, therefore, extremely important to check repeatedly the individual whose blood serologic reactions for syphilis reverse easily or relapse frequently.

Two of the six patients received "adequate" treatment regularly; one of these continued treatment to the point recommended for "biologic cure." Certainly one is forced to the conclusion that there exists a refractory group, however small, who in spite of "adequate" treatment regularly administered may still suffer infectious relapse.

The purpose of recording this group is to reemphasize the fact that infectious relapse can occur for many years after the original infection and to stress that numerically "adequate" treatment, meaning thereby twenty injections of an arsenical and a corresponding number of injections of heavy metal preparations, does not insure noninfectiousness, especially when given irregularly. No rule is infallible as to the total amount of treatment, nor can any arbitrary period of time be stated as the absolute end point of the infectious stage in a given case. It is therefore urged that the criteria of treatment to "biologic cure" and of five years' observation from the time of the original infection [21] rather than the minimum of twenty injections of an arsenical and twenty of a heavy metal preparation, plus two years of treatment and observation,[22] be applied in the evaluation of the individual case and its infectious status.

14. Frühwald, R.: Ueber Abortivbehandlung der Syphilis, Wien. klin. Wchnschr. **30**: 1161 (Sept.) 1917.

15. Harrison, L. W.: Critical Review: The Treatment of Syphilis, Quart. J. Med. **10**: 291 (July) 1917.

16. Stokes, J. H., and Usilton, Lida J.: Continuous and Intermittent Treatment for Early Syphilis: A Critical Evaluation of the American and League of Nations Investigation, with Additional Evaluations, Ven. Dis. Inform. **18**: 66 (March) 1937; abstr., Arch. Dermat. & Syph. **35**: 277 (March) 1937.

17. Dennie, C. C.: Recurrent Early Syphilis, J. Kansas M. Soc. **24**: 78 (March) 1924; Recurrent Early Syphilis, Am. J. Syph. **10**: 3 (April) 1926.

18. Gaté, J.; Cuilleret, P., and Chapuis, A.: Un cas de surinfection chez une syphilitique recente insuffisamment traitée, Bull. Soc. franç. de dermat. et syph. **40**: 1081 (July) 1933.

19. Tzanck, A., and Cord, M.: Syphilis normale insuffisamment traitée rechute sous forme de syphilis maligne précoce, Bull. Soc. franç. de dermat. et syph. **40**: 425 (March) 1933.

20. Stokes, J. H., and Cole, H. N.; Moore, J. E.; O'Leary, P. A.; Wile, U. J.; Parran, Thomas, Jr.; Venderlehr, R. A., and Usilton Lida J.: Cooperative Clinical Studies in the Treatment of Syphilis; Standard Treatment Procedure in Early Syphilis, Ven. Dis. Inform. **18**: 149 (April) 1934; J. A. M. A. **102**: 1267 (April 21) 1934. Stokes, Usilton, Cole, Moore, O'Leary, Wile, Parran and McMullen.[20]

21. Stokes, J. H.: Some Personal Impressions of Present-Day Syphilotherapy, New York State J. Med. **33**: 1324 (Nov. 15) 1933.

22. Stokes, J. H., and Usilton, Lida J.; Cole, H. N.; Moore, J. E.; O'Leary, P. A.; Wile, U. J., Parran, Thomas, Jr., and McMullen, J.: Cooperative Clinical Studies in the Treatment of Syphilis: What Treatment in Early Syphilis Accomplishes, Am. J. M. Sc. **198**: 660 (Nov.) 1934; Ven. Dis. Inform. **15**: 341 (Nov.) 1934.

From the Department of Health and the Mount Sinai Hospital.

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1. Hirshfeld, Samuel; Hyman, H. T., and Wanger, Justine J.: Influence of Velocity on the Response to Intravenous Injections: II. Arch. Int. Med. **47**: 259 (Feb.) 1931. Footnote 5.

SUMMARY AND CONCLUSIONS

1. Although infectious relapse in syphilis is largely a problem of the first two years of infection, a not insignificant number of cases relapse after this period of time.

2. During the course of examination of 120 patients whose infection was two and a half years or more in duration, six were found to have suffered an infectious relapse.

3. Five of the six patients with infectious relapse received more than twenty injections of an arsenical and a corresponding number of heavy metal treatments. Three of the five received this treatment irregularly.

4. Two of the patients in whom relapse occurred began treatment in the seropositive primary stage.

5. Four showed a tendency toward early serologic reversal.

6. No rule is infallible as to the total amount of treatment or the time that must elapse to render the individual patient continuously noninfectious.

7. When possible, it is wiser to strive for the Cooperative Clinical Group standard of from thirty to forty arsenical and sixty weekly bismuth injections than for the artificial median of twenty arsenical and twenty bismuth injections employed as a statistical evaluation device.

MASSIVE DOSE CHEMOTHERAPY OF EARLY SYPHILIS BY THE INTRAVENOUS DRIP METHOD

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INTRODUCTION

BY DR. JOHN L. RICE
Commissioner of Health

One of the most serious obstacles to the eradication of syphilis lies in the fact that even the most modern methods for rendering the disease permanently noncommunicable require a minimum of from eight to ten months of treatment. A therapeutic method which would radically shorten this period and be safe, efficient and not too expensive would go far toward the ultimate conquest of this infection and be of enormous significance in the public health control of syphilis. The present discussion deals with the practical application to medical and public health problems of what began originally as an experiment in pure science—the development along physiologic and pharmacologic lines by Hyman and his associates [1] of a new technic for introducing, with impunity, large amounts of fluids, drugs

and biologic substances by means of the intravenous drip. At Chargin's suggestion, the method was applied for the administration of massive doses of arsenicals in the treatment of early syphilis.

The experiments of Chargin, Leifer and Hyman [2] in 1933 with this new method of treatment seemed to open a new vista on the horizon of syphilis control measures. Twenty-five patients with recent syphilis were given massive dose chemotherapy with the intravenous drip. At the end of five years a check-up showed that very satisfactory results had been obtained,[3] and these warranted a consideration of a much larger study. Expert group judgment was needed. For this reason I appointed a committee of syphilologists and internists to study this problem and to decide whether a more extensive investigation was warranted. The committee concluded that such a study should be undertaken and agreed to sponsor it. With representatives of the health department, this committee has assumed responsibility for the work and has guided the project and assured the greatest care and thoroughness in all its phases. The members include Dr. Charles C. Lieb, chairman, Dr. George Baehr, Dr. Louis Chargin, Dr. Walter Clarke, Dr. Eugene Du Bois, Dr. Harold Thomas Hyman, Dr. John F. Mahoney, Dr. Walter W. Palmer, Dr. Theodore Rosenthal, Dr. Evan Thomas, Dr. Bruce Webster and Dr. John L. Rice. The work of the committee has been made possible by grants from the New York and Markle Foundations and the Friedsam Fund, and through the collaboration of the Mount Sinai Hospital, the New York Hospital, Bellevue Hospital, the United States Public Health Service and the New York City Health Department.

During the period of active treatment the patients were hospitalized at the Mount Sinai Hospital. After discharge from the hospital the patients were assigned alternately to Dr. Evan Thomas at Bellevue Hospital or Dr. Bruce Webster at the New York Hospital for periodic follow-up observation. Dr. John F. Mahoney of the United States Public Health Service made serologic examinations on specimens that were taken at the same time as the routine specimens examined by the department of health. The chemical examinations on arsenic excretion were performed by Dr. Harry Sabotka and Mr. Walter Mann, and the special studies of bilirubin excretion for liver function by a group of three at the Mount Sinai Hospital. The hematologic examinations were made by another group. The department of health has provided cases of syphilis suitable for this treatment and has also, with its personnel, carefully checked and investigated all such patients and carried out necessary follow-up procedures.

If the encouraging results obtained up to now are borne out by subsequent experience, it is likely that the intravenous drip method of arsenotherapy may lead to a radical revision in the management and treatment of early syphilis and improve our control of this most prevalent communicable disease. Aside from the obvious economic advantages to the patient and to the community of an abbreviated and more concentrated therapeutic procedure, the work has a wider public health significance. In a recent article by the members of the Cooperative Clinical Group under the auspices of the United States Public Health Service and sponsored by the League of Nations Health Organization, it was stated that "the aim in early syphilis may be crisply defined as, first, the prevention of transmission by treatment and, secondly, the individual cure."

The method which is now under investigation and for which this is a preliminary report appears to offer the possibility of rendering a large proportion of patients permanently noninfectious and, perhaps, of curing them in a very short time, namely from five to seven days. It has the further advantage of protecting the community from infection by hospitalizing the patient during the period when there is the greatest danger to intimate contact. These possible advantages have warranted the department of health in undertaking this research project.

CLINICAL STUDIES

By Drs. Hyman, Chargin and Leifer

In the chemotherapy of syphilis, Ehrlich [4] originally strove to effect a total sterilization of the infected tissues. The serious and even fatal toxic phenomena that resulted from the administration of the arsenicals in effective spirocheticidal doses led to the abandonment of this and subsequent attempts at massive chemotherapy, in favor of the use of divided doses spread over a period of months or even years.

The concept that these untoward reactions might not be specific to the drug, but rather technical in their origin, arose from the work of Hyman and his co-workers [5] in 1931. These investigators reported that the "rapid intravenous introduction of pharmacologically active or inert chemicals, drugs and biologic fluids may give rise to alarming and, at times, fatal symptoms" ("speed shock"). Thus, in laboratory animals "speed shock" was characterized by a rapid and precipitous fall in blood pressure, usually transitory but occasionally fatal: respiratory distress, manifested either by simple dyspnea, apnea with atelectasis or bronchospasm and noncoagulation of the drawn blood. In fatal instances, such as might be produced with simple saline solutions, autopsies revealed multiple punctate hemorrhages in the viscera, fresh thrombi in the pulmonary veins, and either atelectasis or emphysema of the lungs.

The elimination of "speed shock" was accomplished by the regulation of the velocity of injection through the intravenous drip. With the rate of flow regulated at 2 or 3 cc. a minute, "even highly toxic substances such as anaphylatoxin and histamine could be introduced with complete impunity." [5]

Clinical application of these laboratory experiments resulted in the introduction of intravenous drips for use in the administration of physiologic fluids such as saline solution, dextrose and citrated blood.[6] As a further extension of this work, it was suggested that potent therapeutic agents might be administered "in doses far greater than at present employed and this without serious damage to the cells of the host." The production of "speed shock" with arsphenamine led to the statements (1) that "there might be an intimate relationship between nitritoid crises and 'speed shock' if indeed these were not found to be identical," and (2) that "the intravenous drip may prevent 'speed shock,'

2. Chargin, Louis; Leifer, William, and Hyman, H. T.: The Application of the Intravenous Drip Method to Chemotherapy as Illustrated by Massive Doses of Arsphenamine in the Treatment of Early Syphilis, J. A. M. A. **104**: 878 (March 16) 1935.

3. Hyman, H. T.; Chargin, Louis, and Leifer, William: Massive Dose Arsenotherapy of Syphilis by the Intravenous Drip Method (Five Year Observations), Am. J. M. Sc. **197**: 480 (April) 1939.

4. Ehrlich, Paul, and Hata, S.: The Experimental Chemotherapy of Spirillosis, New York, Rebman Company, 1910, English translation, p. 149.

5. Hirshfeld, Samuel; Hyman, H. T., and Wanger, Justine J.: Influence of Velocity on the Response to Intravenous Injections: I. Arch. Int. Med. **47**: 284 (Feb.) 1931.

6. Hyman, H. T., and Hirshfeld, Samuel: The Therapeutics of the Intravenous Drip, J. A. M. A. **100**: 305 (Feb. 4) 1933; Technic of the Intravenous Drip in Clinical Practice, ibid. **96**: 221 (April 11) 1931. Hyman, H. T., and Touroff, A. S. W.: Therapeutics of the Intravenous Drip (Further Observations), ibid. **104**: 446 (Feb. 9) 1935.

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anaphylactoid reactions, nitritoid and hemoclastic crises." Should certain of the toxic phenomena in massive arsenotherapy prove to be manifestations of "speed shock" rather than the specific effect of the drug molecule, intravenous drip chemotherapy might successfully approach the goal of *sterilisatio magna*.

In 1933 Chargin, Leifer and Hyman [2] treated twenty-five patients who were suffering from recently acquired syphilis. Over the course of five days there was introduced, by means of the intravenous drip, 4 Gm. of neoarsphenamine. Febrile reactions, toxicodermas and mild gastrointestinal symptoms occurred in the majority of patients. There was no immediate or delayed liver or renal damage nor significant parenchymal lesion other than polyneuritis, which occurred in one third of the patients and was annoying rather than incapacitating. Quantitative urinary studies revealed a satisfactory excretion of arsenic averaging about 20 per cent of the total dose. Nitritoid crises were conspicuously absent.

The effect of massive therapy on the clinical manifestations was rapid and dramatic. At the time of the preliminary report,[2] eighteen of the nineteen patients who were followed beyond a period of three months became and remained seronegative. One man, who was lost at the end of four months and who had received but 2.9 Gm. of the drug (an amount which we now believe to be insufficient for complete sterilization) remained seropositive. Six patients disappeared from observation immediately on discharge from the hospital. It seemed reasonable to state that there had been demonstrated "the possibility of administering colossal doses of an effective chemical agent without seriously or permanently damaging the cells of the host." [2]

After five years a second survey of this small group was reported. Five patients never achieved seronegativity. None of these patients were followed beyond the fifth month. The remaining twenty patients all accomplished complete serologic reversal though five members of this seronegative group were not followed a sufficient time for satisfactory observation, since all disappeared before the end of the first year. Fifteen of the seronegative patients were examined on or about the fifth year. Eleven of these had repeatedly negative Wassermann reactions, thus giving assurance that their late clinical course had been wholly and completely uneventful. Four patients required explanatory notes: one man, a hospital orderly, insisted on continuing therapy without our knowledge or supervision. On one occasion, though he had repeated negative Wassermann reactions both before and after, his serum reaction was reported to be 2+ in the blood and the spinal fluid. He presented no clinical manifestations of the infection and at the last visit was completely clear in all respects. A second member of this group was not seen between the end of his first month following treatment, when his reaction was 4+, and a period of four and a half years, when the blood, spinal fluid and teleoroentgenogram were normal. Two patients became reinfected with syphilis. In one instance the evidence was indubitable, in the other highly presumptive, though there was the possibility that this may have been a cutaneous relapse.

At this time [3] the conclusions were broadened to include the statements that (*a*) "primary and early secondary syphilis could not only be cured by the massive injection of neoarsphenamine by the method described but a permanent and complete result was possible though no other therapy was introduced in any other way or at any other time"; (*b*) the method offered "a means for the rapid and successful eradication of this dread disease" and "possibly presented a new vision of the syphilis problem for public health officials and legislators."

PROTOCOL

Repetition of this earlier work was made possible through the efforts of Commissioner Rice and the Syphilis Project Committee. Treatment was limited to male patients with primary or early secondary syphilis. Eighty-six men were studied and treated. The average dose of neoarsphenamine was slightly in excess of 4.1 Gm. The average duration of treatment was slightly less than five days.

TECHNIC

As in the previous study, the intravenous drips were set up so that 5 per cent dextrose was administered by the gravity method at a rate approximately 100 cc. an hour. At the end of each hour there was added a solution of 0.1 Gm. of neoarsphenamine dissolved in 50 cc. of 5 per cent dextrose. In turn, this was followed by another hour of the plain dextrose, followed by another 0.1 Gm. of the drug until the total daily dose had been administered. Thus, in a period of fifteen hours a patient might receive 1,500 cc. of 5 per cent dextrose and 1 Gm. of neoarsphenamine. The treatment was usually started at 8 a. m. and continued throughout the day, the needle remaining in situ. The diet was semisolid and rich in carbohydrate.

TOXICOLOGY

Forty-nine patients (57 per cent) experienced primary or Herxheimer fever. The average duration of this fever was slightly over one day and the average height was 102 F. The highest temperature recorded was 105 F. and the longest duration of the febrile reaction was four days.

A secondary fever, usually appearing toward the latter part of therapy or after the termination of the injection, was noted in fifty-four patients (63 per cent). The average duration of this fever was slightly under four days and the average height of the temperature was 102.8 F. The highest elevation was 105.4 F. and the longest duration was ten days. Those with primary fever did not necessarily have secondary fever; similarly, those with secondary fever might not have had the primary fever.

TOXICODERMAS

Toxicodermas were usually associated with the secondary fever. The immediate eruptions were scarlatiniform, morbilliform or erythema multiforme-like in character and occurred in forty patients during the period of hospitalization. An additional group of four patients developed toxicodermas while under observation in the follow-up clinic, so that this complication was present in forty-two patients (52 per cent). One patient developed a desquamation of the skin following a toxic erythema but the process was mild and recovery was rapid. A true dermatitis exfoliativa occurred once and was followed by complete recovery.

It is interesting to note that neither gonorrheal infection nor the virus of the common cold occurring simultaneously with syphilis yielded to these massive doses of neoarsphenamine.

NEURITIS

Peripheral neuritis occurred in thirty-one patients (38 per cent) but none were severely incapacitated. The neuritis developed two or three weeks after discharge from the hospital and lasted as long as from four to six months. There was no relationship between arsenic excretion or retention and the polyneuritis.

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KIDNEY FUNCTION

Daily routine urinalyses, blood chemistry examinations on admission and discharge, and concentration tests failed to reveal any significant evidence of renal irritation or damage.

LIVER FUNCTION

Liver function was studied in a routine manner through observations of clinical jaundice, daily examination of the urinary urobilin and estimation of the icterus index on admission and discharge. Four patients developed mild jaundice. In none of these was there any apparent permanent damage. Eight patients showed an increase in the urobilin to more than one tenth at one time or another, but on discharge all were within normal limits. Seven patients showed an icterus index that exceeded 10 at least once during the course of hospitalization, though on discharge the index was significantly elevated in none. An additional five patients showed an icterus index of 15 or more in the follow-up clinic but none developed significant hepatitis.

Bilirubin excretion tests [7] were performed on ten consecutive and unselected patients. The first test was made before the institution of treatment, and the comparative reading was checked immediately following the completion of therapy. Three of the ten patients showed slight impairment of hepatic function, i. e., retention of 100 per cent or more bilirubin. None of these patients showed any clinical evidence of hepatic damage.

BLOOD COUNT

Complete blood counts were made on admission and discharge. No abnormalities were noted in the erythrocytes or leukocytes.

A hemorrhagic tendency developed five weeks after treatment in one of the early patients. When it was found that he had a thrombocytopenia (5,000 platelets), routine platelet counts were included in the study. It was the original impression that the thrombocytopenia resulted from arsenotherapy in this patient. More careful study by Dr. Nathan Rosenthal, however, led him to the conclusion that this was an instance of chronic idiopathic thrombocytopenia, intensified but not fundamentally caused by the administration of the drug. At Dr. Rosenthal's suggestion a splenectomy was performed, following which the platelets rose and remained normal.

Through a fortunate error there was noted a second interesting observation concerning thrombocytopenia. The routine blood count, which should have been performed before the institution of therapy, was delayed in one patient until just after the first small and diluted dose of the arsenical had been introduced. By this time the platelets had already dropped to 20,000. The injections were immediately discontinued. Five days later the platelets had risen to 200,000. The patient was rejected for further therapy with the arsenicals. Following a routine course of treatment with the other heavy metals, he was readmitted to the hospital. His blood platelets were then 240,000. He was given 0.1 Gm. of neoarsphenamine and again the platelets fell to 60,000. This experience suggests that idiosyncrasy rather than overdosage may be the determinant factor in the production of this as well as other toxicologic phenomena.

CEREBRAL SYMPTOMS

Two patients gave cerebral symptoms that suggested hemorrhagic encephalitis. In one instance, without other antecedent or later difficulties, the patient had a single convulsion. The spinal fluid was normal and the course, otherwise, uncomplicated. In the second instance, death occurred. This man was an 18 year old Negro, admitted with a seropositive primary syphilis. He received 1 Gm. of neoarsphenamine the day after admission. This was followed by a primary fever to 103 F. The next and succeeding two days his temperature was normal and he received 1 Gm. daily on each of these three days. On the last day of treatment, after receiving 0.4 Gm. of the drug, he became nauseated and vomited. Treatment was discontinued, since he had received 4.4 Gm. in all. The next day his temperature was normal, but the following morning, or six days after the beginning of treatment, a toxicoderma was observed. At this time there was no febrile reaction and no other complaint. At 3 p. m. he appeared somewhat dazed and had a tremor of the hands and head pain. At midnight he went into a convulsive seizure followed by stupor. The spinal fluid was clear, was under increased pressure and contained 20 cells per cubic millimeter with increase in the globulin but negative Wassermann and colloidal gold reactions. Despite vigorous treatment the convulsions continued, the temperature gradually rose to 107.4 F. and he died on the third day. All of the various laboratory examinations were normal. No autopsy could be obtained. A careful review of his records and the course of the symptoms during hospitalization failed to reveal any extenuating circumstance. Since this patient and the aforementioned one with the single convulsion were treated simultaneously, the suspicion arose that there may have been some unusual toxicity in the particular batch of the drug employed at this time. Samples were submitted to the National Institute of Health and examined by W. G. Workman, acting chief. No unusual variation from the original assay was found, and the fatality must be recorded as the direct result of therapy.

Cole and his associates [8] in a series of 1,212 cases observed twelve deaths, of which six were due to hemorrhagic encephalitis. Five of the six patients received four or fewer injections of the average dose of the arsenical. The sixth patient received nine doses. These facts suggest the possibility that hemorrhagic encephalitis, like thrombocytopenia, may result from idiosyncrasy rather than overdosage.

It is noteworthy that nitritoid crises, the various types of atrophy and degeneration of the liver, aplastic anemia and pulmonary embolizations were conspicuously absent as toxicologic phenomena.

ARSENIC EXCRETION STUDIES

The fate of the injected arsenic was followed by quantitative analyses of the total urine and stool specimens collected, during therapy, in twelve consecutive and unchosen cases. Of the 800 mg. of arsenic administered in the course of therapy, 160 mg., or 20 per cent, was excreted in the urine. This corresponds closely with Leifer's experience in our first series,[2] in which approximately 150 mg. of arsenic was found to be the average excretion over a similar period. It was not possible to do stool analyses in the first series, and the results of the fecal arsenic excretion in the present series was regarded with considerable interest, for it has been

7. Soffer, L. J.: Postarsphenamine Jaundice, Am. J. Syph., Gonor. & Ven. Dis. **21**:309 (May) 1937.

8. Cole, H. N., and others: Arsenical Reactions in Treatment of Syphilis, J. A. M. A. **97**:897 (Sept. 26) 1931.

generally believed [9] that the fecal elimination is higher than urinary excretion. Confirming this view, an average of 260 mg., or 32 per cent, was recovered from the total feces during the course of therapy. Thus, 52 per cent of the injected arsenic was accounted for through urine and stool during the treatment period. It was not possible for us to determine the amounts that may have been excreted through other channels such as the skin.

In a few instances the urine and stool analyses were carried on for several days following the completion of actual therapy. An additional 1.7 per cent was recovered from the urine (ten specimens) and an additional 9.5 per cent from the stool (seven specimens). Thus, in certain of the completed cases as little as 27 per cent of the arsenic was unaccounted for at the end of this brief period.

During hospitalization an average approximating 60 per cent of the total arsenic dosage was recovered from urine and feces, indicating quite clearly that significant retention or accumulation of the drug did not occur.

CLINICAL RESULTS

Rapid healing of both primary and secondary lesions was noted. Dark field examinations invariably became negative within twenty-four hours. The patients were apparently rendered free from infectivity on discharge from the hospital, a significant point in the public health aspect of syphilis control. This is the more striking in comparison with the results in patients treated by routine methods. For example, Cannon [10] observed that in twenty patients using arsphenamine in the routine manner the average time for involution of the chancre was 12.5 days following 3.1 injections. With neoarsphenamine the involution of the chancre was 21.3 days after 4.8 injections. Since these patients were ambulatory it follows that, for at least two to three weeks, the syphilitic patient treated by routine methods is a hazard to the community to which he is returned, whereas patients treated by the massive dose technic are probably noninfectious on discharge from the hospital.

An interesting clinical observation in our patients was their sense of well-being. Striking gains in weight were frequently recorded. During therapy patients sometimes ate voraciously. Since most of the patients were recruited from the unemployed and underprivileged, this may not have been wholly attributable to therapy; but it at least emphasizes the point that therapy is not completed at the expense of general nutrition.

EFFECT ON SERUM REACTION

Chargin [11] has previously expressed the view that the serum reaction is the most valuable guide for determining the efficacy of any method of treatment in early syphilis. In the present work this was particularly borne out by the amazing sensitivity, accuracy and close parallelism that existed in the results obtained by Senior Surgeon John Mahoney working at the United States Marine Hospital at Stapleton, Staten Island, and Mr. John Koopman, analyzing duplicate blood samples at the Laboratory of the New York City Department of Health.

The technic employed by Dr. Mahoney was as follows:

The reports submitted in this study were produced by the Kolmer quantitative complement fixation technic. The antigen used was the "new Kolmer antigen," the test dose being determined by the titration method of Boerner and Lukens. High titer lyophile complement was employed and the natural anti-sheep hemolysin was removed from the serums through the use of washed sheep's blood cells. Serum dilutions of 0.2, 0.1, 0.05, 0.025 and 0.005 cc. were used and the degree of inhibition of hemolysis indicated by the conventional numeral method for each dilution. In all details of technic there was strict adherence to the procedure recommended by the originator of the method.

Readings varied from 00000 to 44444.

The technic employed by Koopman is as follows:

The antigen used was prepared by alcoholic extraction of dried beef heart. The alcoholic extract, after evaporation, was mixed with an equal portion of acetone. The acetone insoluble fraction was redissolved in alcohol and 0.2 per cent cholesterol added. To each of twelve tubes were added 0.1 cc. of the patient's serum, 0.1 cc. of antigen, 0.2 cc. of salt solution and increasing amounts of complement, the first tube receiving 0.1 cc. and each succeeding tube receiving 0.05 cc. additional until the last tube contained 0.7 cc. The tubes were then permitted to stand at 6 C. for eighteen hours, after which 0.3 cc. of sensitized cells was added.

If complete fixation occurred in the first tube, the serum was given a value of 4+; a value of one (1) was then added for each of the other tubes that showed complete fixation, so that the maximum reading was 15+. If the reagin titer was reduced to the point at which the first tube showed incomplete fixation, 0.02 of serum was used in order to obtain readings of less than 4+. This quantitative test, as employed by Koopman in the drip cases, was more sensitive than the routine test used in the New York City Department of Health.

The Mahoney and Koopman serologic studies subject these patients to most highly sensitive tests. The test was repeated at first every two weeks and then every month.

LOST FROM OBSERVATION

Seven patients (42, 46, 47, 64, 68, 70 and 84) failed to report to the follow-up clinics after discharge from the hospital.

DEATH

One patient (80) was the unfortunate Negro who succumbed to a hemorrhagic encephalitis immediately following treatment.

FAILURES

The course in four cases has been clinically or serologically unsatisfactory:

Two of the men (14 and 76) had cutaneous relapses. The first of these may possibly have been reinfected, since his wife showed evidences of active syphilis. In the absence of complete evidence of reinfection, however, he will be reported as a failure so that in this instance, as in all others, the results might be reported with the utmost conservatism.

Two patients (52 and 66) showed serologic relapse. In each instance the present titration of reagin is at the admission level. The spinal fluid and clinical examinations are normal and further treatment is being withheld, for there still exists a remote possibility that seroreversal may yet occur.

PENDING CASES TENDING TOWARD SEROREVERSAL

A trend toward seronegativity is occurring in seven patients whose bloods have not yet completely cleared.

Patient 4 is completely normal in the Kolmer titration, but the Wassermann is still 1+ at fifty-eight weeks. The spinal fluid and physical examinations are normal. This patient had a splenectomy at his twentieth week because of an idiopathic thrombocytopenic purpura.

9. Underhill, F. P., and Davis, S. H.: The Excretion of Arsenic After Serial Administration of Arsphenamine and Neoarsphenamine, Arch. Dermat. & Syph. 5:40 (Jan.) 1922.
10. Cannon, A. R.: Outline of Treatment for Syphilis, New York State J. Med. 39:70 (Jan. 1), 145 (Jan. 15), 254 (Feb. 1) 1939.
11. Chargin, Louis: Antisyphilitic Therapy, J. A. M. A. 76:1154 (April 23) 1921.

Patient 38 presents an obstinate serum reaction in which, after forty-four weeks, the Wassermann has been reduced from 12+ to 4+ and the Kolmer from 44444 to +0000. The spinal fluid is normal and the recent progressive changes in the tendency toward seronegativity give promise of a late clearing.

Patient 49, not observed after his discharge from the hospital for almost nine months, had an admission Wassermann reaction of 4+ that has been reduced to 0 and an admission Kolmer of 44444 that is now 43100 with completely negative spinal fluid.

Patient 59, whose highest Wassermann reaction was 12+ and Kolmer 44444, at thirty-nine weeks, has now a 1+ Wassermann and a normal Kolmer.

Patient 71 entered the hospital with a Wassermann reaction of 6+ and a Kolmer of 44444. At eight weeks the former was ± and the latter 11000. The patient was not again seen by us but eighteen weeks after his discharge from the hospital, and ten weeks after his last serologic observation, he appeared at the Charles V. Chapin Hospital in Providence, R. I., with a fresh sore on the penis that was located in an area different from the previous scar. Dark field examination was positive. He gave a definite history of exposure. The blood Wassermann reaction was negative in the alcoholic antigen and ± with the cholesterinized antigen. His spinal fluid was normal. There is abundant evidence, therefore, for regarding this as a reinfection but again, in the interests of conservatism, we are reporting the case among those which are questionable. Routine therapy was instituted for this patient. It is interesting to observe that, despite the fears of sensitization to arsenic, no unusual toxicologic phenomena developed during the second course of treatment. This was the experience with patient 14, reported as having a cutaneous relapse, who received a second course of massive dose therapy.

Patient 79 at his last observation, at eighteen weeks, had a Koopman Wassermann reaction that had fallen from 13+ to 5+, and a Kolmer that had been reduced from 44444 to 443 ± 0.

The last patient (86) in the pending group of seven entered the hospital with a Wassermann reaction of 10+ and a Kolmer reaction of 44444. His spinal fluid showed a 4+ routine Wassermann reaction, 11 cells, a globulin of 4+ and a colloidal gold of 55544332211. He has now been observed for forty-four weeks. The spinal fluids, taken at the end of two and six months, are normal. The blood Wassermann reaction has been reduced to 4+ and the Kolmer to 1 ± 000. Both clinical and neurologic examinations are completely normal.

Of these seven patients tending toward seroreversal, none show any evidences of their infection other than a slight and reduced amount of reagin in the blood. It is not unlikely that further observation will show complete clearing in some, at least.[11a]

COMPLETE SEROLOGIC REVERSAL

Sixty-seven patients are already completely seronegative. This constitutes 86 per cent of the surviving patients who were adequately followed, including those who are still pending, and 94 per cent of the survivors excluding, for the time being, those patients who are still pending.

The composite picture of the seronegative group shows that the admission Wassermann reaction was 8 +, the Kolmer 44442, the average time for the achievement of seronegativity slightly over twelve weeks, the average number of negative blood tests 6.7 and the average span of observation to date forty-five weeks. Fifty-seven patients have had normal spinal fluid examinations, the majority having been taken between the eighth and the twelfth month.

11a. In the four months that has elapsed since the preparation of this paper, three of these pending cases have become completely seronegative: Patient 4, now in the seventy-fifth week of observation, has had four examinations of his serum without any evidence of any reagin since the sixty-second week. Patient 59, now in the sixtieth week of observation, has had three blood examinations showing complete negativity, and one negative spinal fluid. Patient 86, whose spinal fluid was positive on admission to the hospital and now in the sixteenth month of observation, became seronegative at fifty-two weeks and now has had four normal blood examinations, as well as a normal spinal fluid.

There still exists the possibility that there may be added to this group of satisfactory cases some now in the group of seven reported as pending cases tending to seroreversal.

With three exceptions, these patients have been observed for six months or more. As many as thirteen negative reports have been received on a single individual and but two patients have fewer than three completely normal readings.

These results, of course, are not to be interpreted as final. As time progresses it is our intention to present a further study, and Commissioner Rice has arranged, through the agencies interested in this work, to provide adequate funds for several years of detailed study. As in the previous report, no conclusion can be ventured at this time beyond the statement that the massive dose method of arsenotherapy by the intravenous drip method is capable of producing a serologic reversal in the vast majority of patients under observation. The later course of these patients, the possibility of serologic or clinical relapse, cannot now be hazarded. However, the five year results [9] on the previously reported small group might give rise to the conjecture that no important or significant sequelae are to be anticipated.

The serologic results have been retabulated according to the duration of infection preceding treatment. While the histories are not always wholly reliable, fifty-four patients, of whom we have complete records on forty-six, sought treatment within eight weeks of infection. All are seronegative on an average of ten weeks or less and the average of the highest Koopman titration approximates 7 +.

These figures indicate that the sooner the patient seeks treatment the lower the titration of the Wassermann reaction; the lower the Wassermann titer, the more rapid and sure will be the achievement of seronegativity.

The thirty-two remaining patients did not seek treatment until the infection was present for eight weeks or more. All of the unfavorable cases are included in this later group, illustrating again the importance of early treatment. However, twenty-one of these late cases achieved and maintained seronegativity. Whereas in the early group this occurred at about the tenth week on the average, in this group it did not occur until approximately the sixteenth week. Similarly, the Koopman titration checked on the history of prolonged infection and served in a prognostic sense, for the average was 11 + as opposed to 7 + in the earlier series.

These results may have prognostic significance, for they suggest, even in a series so small, that massive dose chemotherapy may reasonably be expected to affect a complete and rapid serologic reversal provided the duration of the infection is eight weeks or less and the Koopman titration does not exceed 7 +.

COMPARISON OF THE LATE AND EARLY SERIES

It is possible now to compare the toxic phenomena and the early clinical observations in the original twenty-five patients and the present group of eighty-six.

(*a*) *Toxicology.*—In neither group was a nitritoid crisis observed. Primary fever was present in 80 per cent of the first and 57 per cent of the second series. Secondary fever was present in 68 per cent of the first and 63 per cent of the second group, the toxicoderma being present in 32 per cent of the first and in 52 per cent of the second series. In the second series 200 mg. daily of vitamin C was administered orally during

therapy, since it had been reported[12] that vitamin C protects against these particular toxic phenomena. Our work does not indicate that the administration of vitamin C is of value as a prophylactic against the secondary fever and toxicodermas. Polyneuritis was present in 32 per cent of the first and 38 per cent of the second series. In the second series the patients were treated daily with 6,000 units of vitamin B into the drip and 1,200 units daily by mouth thereafter during the hospital stay. It had been suggested that vitamin B might protect against chemical polyneuritis but this hope is not confirmed by our experiences. The therapeutic use of vitamin B as practiced in the follow-up clinics after the development of polyneuritis similarly seemed not to affect the course of this complication.

Significant renal or hepatic damage was not observed in either series. No late parenchymal damage was experienced. The single dire complication that arose was the fatal case of hemorrhagic encephalitis occurring in the second and larger series.

The toxicologic phenomena in the two series were therefore quite parallel, the discrepancies probably being due to the factor of chance that will necessarily enter in any small series.

(*b*) *Clinical Results.*—The immediate clinical results were remarkably parallel in the two series. Infectivity was of short duration, the spirochetes disappearing from the lesions within twenty-four hours. Serologic reversal was obtained in approximately 90 per cent in both groups.

Of the completed cases there are but five acknowledged failures. In the first group there was one patient with inadequate therapy (2.9 Gm.) and persistent seropositivity at his last visit at four months. In the second group there were two clinical relapses and two serologic relapses. Thus far in neither group has there been any other manifestation of syphilis. The original group of twenty-five followed over the course of five years showed no late tendency to relapse either clinically or serologically. Normal spinal fluid and cardiac condition gave further assurance that sequelae had been averted. The close parallel that exists between the two series of cases in the early experience gives promise that equally favorable data will be obtained in the late observations of this current group.

SUMMARY

The massive dose method of chemotherapy in early syphilis, apparently, yields immediate clinical and serologic results that equal the best results that are obtainable by the optimal methods of routine continuous treatment. In fact, there is more than a suggestion that our results, obtained without the use of bismuth and mercury compounds, excel the best reported results that come from the most eminent syphilologists working under optimal conditions.

We are not yet satisfied, however, that the factor of toxicity cannot be greatly reduced. Our experiences with the febrile reactions, the toxicodermas, the neuritides, and particularly the fatal incident due to hemorrhagic encephalitis, have made us emphasize again that this method of treatment must still be considered in an experimental phase and should not be employed for routine clinical use until greater safeguards have been established. Vitamin therapy, both for prophylactic and for curative purposes, has proved ineffectual in the management of the toxicologic phenomena.

Massive dose chemotherapy, if it proves safe, practicable and effective, holds out the possibility of greater convenience, greatly shortened period of infectivity, removal of the syphilitic person from circulation during his active months, and a course of therapy to be measured in days rather than months. It is too soon to judge of the ultimate effect of the method, though the small group of cases followed for a period of five years appear to be clinically and serologically cured.

12. Dainow, L.: Relation of Vitamin C to Intolerance to Arsenobenzenes, Presse méd. **45**:1670 (Nov. 24) 1937.

ABSTRACT OF DISCUSSION

Dr. R. A. Vonderlehr, Washington, D. C.: Every new method for the treatment of syphilis described by reputable investigators deserves the most careful study. While modern therapeutic methods are effective if generally applied, they are expensive and inconvenient for the patient. The medical and public health professions cannot, however, accept either new methods or new drugs for the treatment of syphilis without subjecting them to the most intensive and critical investigation. Those in the Public Health Service in charge of the control of syphilis feel that any new method or drug advocated must meet the following requirements before it can be accepted as an equal of the continuous alternating scheme of treatment described by the Cooperative Clinical Group: 1. The new method must be as actively spirocheticidal as the continuous alternating method of treatment with the arsphenamines and must heal open lesions as quickly. 2. It must prevent the communicable forms of relapse with the same degree of efficiency. 3. It must prevent the late crippling manifestations of syphilis to the same extent. The evidence presented by the authors indicates that the intravenous drip method does bring about rapid healing of the open lesions. Whether it prevents mucocutaneous relapse is not finally established. The indications are that communicable relapses occur in a somewhat higher percentage of the patients treated with the drip method than with the continuous alternating scheme, although statistical study of present figures shows that the difference is not significant, owing to the dearth of patients treated by the former plan. It has not been possible for advocates of the intravenous drip method to obtain sufficient information regarding its ability to prevent the late crippling manifestations of syphilis because sufficient time has not elapsed since the procedure was first used. Toxic reactions to the antisyphilitic drugs with the two schemes of treatment must also be considered. The untoward effects resulting from treatment with the intravenous drip method cannot be compared with material which has been published by the Cooperative Clinical Group because in the former instance the reaction rate is based on the number of patients treated and, in the Cooperative Clinical Group material, on the number of reactions per thousand injections of drug. When a larger number of patients have been treated by the drip method, so that the material becomes more significant statistically, the reaction rate should be compared on the same basis. I am prepared to offer the cooperation of the Public Health Service in a study of this kind, should the authors desire it.

Dr. George V. Kulchar, San Francisco: I have been interested in the development of the massive intravenous drip method and the methods that have been developed abroad for massive therapy in syphilis. It closely approaches our ideal, but the high incidence of reactions evidenced by Dr. Chargin, Dr. Hyman and their associates, and that observed by Tzanck in Paris would indicate that this method should be approached with care. There may be some method by which these abnormally frequent undesirable reactions, particularly hemorrhagic encephalitis, might be avoided. Dainow in France has been able to detoxify the arsphenamines by the addition of ascorbic acid, and I wonder whether this has been tried by the authors. If it should be applicable, the addition of ascorbic acid to the solution might be efficacious in preventing hemorrhagic reactions. Ascorbic acid, as you know, is concerned with the maintenance of vascular permeability, which is the pathologic lesion in hemorrhagic encephalitis. I would be interested in hearing Dr. Hyman discuss this point.

DR. EARL MORRIS, Hays, Kan.: The point of technic was mentioned. How do they get around the atopic effect of having the drug made up a fairly long time? How long is it safe?

DR. HAROLD T. HYMAN, New York: As to the effect of ascorbic acid on the toxic manifestations secondary to arsphenamine therapy, we have given adequate doses of vitamin C without observing any perceptible favorable effect. I regret that the work of Tzanck has been brought into the discussion. I hoped not to have to mention it. Following the publication of our work in France, Tzanck initiated his so-called week-end treatment. The work has been badly controlled, early cases were not chosen, the patients apparently were incompletely examined. Following the week-end course in which Tzanck used exactly our dosage and our technic, though he denied knowledge of our published work, his patients received a course of bismuth injections and, in many instances, a second and even third "week-end treatment" with neoarsphenamine. We believe that the work was reckless and uncontrolled. Already he has published records of two deaths. We do not wish our work to be confused with his. In answer to a written question from Dr. Wilbur, the rate of administration is about 100 cc. per hour. The drip is put on at about 8 a. m. and the patient usually has had the completed dose by 5 or 8 p. m. At this time the drip is discontinued and the patient is free to carry out normal activities. To prevent oxidation, the neoarsphenamine solution is made up 1 decigram at a time and immediately administered.

THE EXANTHEM OF ACUTE MONONUCLEOSIS

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OAKLAND, CALIF.

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1939

In view of the increasing frequency of the recognition of acute mononucleosis and its occasional occurrence in epidemic form, we have felt that it would be worth while to describe further the exanthem that occasionally occurs with it. We are not the first to do so, as Tidy,[1] Lyght,[2] Sadusk[3] and Isaacs[4] have mentioned the eruption in articles on the disease.

THE DISEASE

Acute mononucleosis has been known since Pfeiffer described it in detail in 1889 and called it "glandular fever." In brief, it may be described as an acute infectious disease occurring usually in young people and characterized clinically by malaise, fever and glandular swellings. From the laboratory standpoint there is a characteristic blood picture and agglutination test. The typical case begins acutely with sore throat, general malaise and aching, fever and sometimes nausea and vomiting. There is a generalized lymphadenopathy, but the cervical glands, particularly those in the posterior triangle, are most commonly involved. The spleen is quite commonly enlarged. The fever is generally of a moderate degree and may last from a few days to several weeks. Some cases of mononucleosis present an initial leukopenia, a rising temperature, an enlarged spleen, abdominal pain, and a rash suggesting rose spots. Such cases may sometimes be confused with typhoid until further laboratory work confirms the diagnosis. Complications practically never occur. Convalescence varies greatly and may be prolonged and characterized by weakness. There is another type of glandular fever in which the onset is more insidious, the symptoms are less acute and the febrile period and lymph node enlargement more prolonged.

From the Cowell Memorial Hospital, University of California, Berkeley, Calif.

1. Tidy, H. L.: Glandular Fever and Infectious Mononucleosis, Lancet **2**: 180-186 (July 28), 236-240 (Aug. 4) 1934.
2. Lyght, C. E.: Infectious Mononucleosis, Journal-Lancet **58**: 91 (Feb.) 1938.
3. Sadusk, J. F., Jr.: Temporary Positive Kahn and Wassermann Reactions in Infectious Mononucleosis, J. A. M. A. **112**: 1682 (April 29) 1939.
4. Isaacs, H. J.: Infectious Mononucleosis, Illinois M. J. **71**: 161 (Feb.) 1937.

LABORATORY EXAMINATION

Two laboratory procedures are characteristic and diagnostic: the blood picture and the heterophile antibody agglutination test. The typical blood picture is that of leukocytosis associated with a marked mononucleosis. The total white blood count generally ranges from 10,000 to 20,000. The mononuclear cells constitute from 60 to 90 per cent of the total cells. Lyght [2] has shown that the total white cell count and the degree of the mononucleosis are directly proportioned to the height of the patient's fever. Return of the count to normal is rather slow, often being delayed for several weeks. We know of a physician whose count did not return to normal until months later. The agglutination test depends on the existence in this disease of heterophile antibodies which produce agglutination of sheep corpuscles. Another finding of considerable significance is the presence of fenestrations of the cytoplasm of the mononuclear cells.

THE ERUPTION

A careful review of the textbooks on dermatology and general medicine as well as the current literature failed to disclose mention of an eruption in this disease except as will be mentioned.

Tidy [1] says:

> There is no characteristic eruption constant for all types. In the glandular and anginose types eruptions are rare—especially among children between 6 and 15 years of age. Urticaria occasionally develops. Amongst younger children and infants eruptions are more frequent and variable, and may be urticarial, erythematous or rubelliform.
>
> *Character of Eruptions.*—There are two important types: (1) a macular eruption in the febrile type and (2) a rubelliform eruption, mainly in young children. In the febrile type, in the English 1930 epidemic, the rash was a prominent feature and present in the majority of cases. It usually was referred to as a maculopapular or roseolar eruption and closely resembles enteric. It has been described fully in the section on the febrile type. It is rare in childhood. In the ordinary course it fades before the glands become palpable; this is almost invariably so in adults. The rubelliform eruption occurs mainly among young children. It may appear at the onset, before or with the glandular enlargement or later in the attack. Glanzmann is convinced that in many cases it is indistinguishable from rubella, and also that the occipital glands are frequently enlarged. As in rubella, the eruption may be confluent in parts and discrete in others. Other authorities describe it as scarlatiniform.
>
> Eruptions may develop which have been variously described as urticaria, erythema nodosum or morbilliform. These are usually transient. Rolleston saw a case diagnosed as typhus. Goldman observed absolute lymphocytosis in a case diagnosed as chickenpox. Herpes labialis has been recorded many times. I have never seen it in the ordinary glandular type.

Lyght,[2] in describing 100 cases seen in the student health service of the University of Wisconsin, reports that 5 per cent of his patients developed a rash. We repeat his description:

> The rashes mentioned were in general of a fine, discrete, pinkish red maculopapular or macular type, confined mostly

to the trunk, neck, proximal parts of the extremities, and less frequently seen distally on the face. Two were reddish brown in color and two purplish red. Three were truly urticarial, two frankly purpuric, three mildly pruritic, and two showed some tiny vesicles scattered among the maculopapules. No pustules were observed. The rashes described best fell within the category of so-called toxic dermatitides, if a descriptive term is to be attempted that will give a reasonably accurate picture of the exanthems seen. It should be understood, however, that no two of the rashes were identical.

Sadusk [3] reported another case associated with an eruption as seen in German measles. He said: "On admission there was observed a rather faint morbilliform eruption over the neck, chest, abdomen, upper part of the back and in the right antecubital fossa." He remarked, "On admission the case was regarded as one of German measles."

Isaacs [4] stated that in a few cases maculopapular cutaneous rashes were present.

Our hospital records among students at the University of California show a total of ninety-one cases of acute mononucleosis. Of these seventeen, or 18.5 per cent, presented an associated eruption. It was not until we had observed a number of eruptions on our patients and had labeled them "toxic" that we began to realize that the incidence was strikingly high. We were chagrined at having made a clinical diagnosis of German measles in several of our cases which were later proved to be infectious mononucleosis with positive agglutination tests and characteristic blood counts.

It is difficult to give a composite description of the rashes seen on our patients. They were, in general, of a fine macular character with occasionally a certain papular element present. The trunk was most frequently involved, with the face running a close second. Probably the best description one could give of these rashes would be to say that they were often practically indistinguishable from German measles. Twelve of the seventeen instances of eruption seen by us were of this type. The other five were less characteristic, consisting of multiform lesions or of a slight erythema of the face or abdomen. Itching was mild or absent. The eruption appeared at no regular period of the disease, being first noted anywhere from the third to the twentieth day. They lasted from three to seven days and faded without desquamation.

CRITICISM

Since most of these patients had received some drug or other (frequently a barbiturate) such as is given for symptomatic relief of febrile diseases, it might fairly be maintained that some of the eruptions were due to these drugs. This we cannot deny. However, very few such eruptions have occurred following the administration of the same drugs to far more patients who were hospitalized because of such diseases as influenza and infections of the upper respiratory tract. Therefore we feel that the great majority of these eruptions must have been independent of drugs and due directly to the acute mononucleosis.

SUMMARY

Seventeen instances of eruptions were observed in a series of ninety-one cases of proved acute mononucleosis.

Twelve of the seventeen cases were practically indistinguishable from the rash of German measles. Five were less specific.

Acute mononucleosis frequently presents a morbilliform eruption as an outstanding objective symptom.

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DYSPNEA OF SILICOSIS: WHAT CAUSES IT?

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Dyspnea, or the labored breathing of miners' phthisis, as it was called, was well known to patient and doctor alike long before the word silicosis was coined.

The crux of the problem of what causes the dyspnea of silicosis is well illustrated and described in figures 1 and 2 with their elaborate captions.

Dyspnea is the outstanding symptom of silicosis, yet in our opinion it has not been accounted for by hitherto recognized pathologic changes. Dyspnea is the prime factor that incapacitates the worker for hard labor and subsequently for any labor, and it is dyspnea that eventually terminates the victim's sufferings, yet dyspnea is singularly absent in many cases of well marked silicosis in which there are classic roentgenographic signs. It is universally conceded that small, hard, dense nodules in the lung are pathognomonic of silicosis, yet these small, hard, dense nodules are either absent or relatively infrequent in some cases of advanced silicosis in which dyspnea is an outstanding symptom. These silicotic nodules as observed roentgenographically often progress to an extreme stage before they cause dyspnea, yet dyspnea may occur and terminate fatally without a preponderance of the typical well defined nodules. Spherical whorls or nodules are considered pathognomonic of silicosis, yet we believe they constitute a protective mechanism—a constructive rather than a destructive process—and are not responsible for the outstanding symptom of silicosis: dyspnea.

Advanced silicosis is frequently found only by accident, when the patient is being examined roentgenologically for some other lesion or injury, such as a fractured rib. Such accidental discoveries are frequent, but, on the other hand, roentgenograms may show no evidence of typical nodulation even in a case of advanced silicosis such as the one illustrated in figure 2, and the one reported by Chapman.[1] A sandsoap worker died after a short illness, and on microscopic examination of the sections, the younger Mallory confirmed the roentgenologic evidence by reporting that the small, hard, dense nodules, considered pathognomonic of silicosis, were so overshadowed by other types of morbid changes that it was difficult to find them. Through the courtesy of Dr. Mallory of the Massachusetts General Hospital we had the privilege of seeing and studying the sections in this case and of confirming his observations. Certainly the very few nodules present were not the cause of the dyspnea from which the patient died. Typical silicotic nodules were inconspicuous in the West Virginia cases and also in some of the South Jersey cases.

If nodulation is not the cause of dyspnea what does cause it? In this article we will consider in detail three causes of the dyspnea of silicosis, but before proceeding we must consider the three types of silicosis which have been previously recognized and described: [1a]

Peribronchial silicosis: chronic silicosis without typical nodulation and without dyspnea (Pancoast).

1. Chapman, E. M.: Acute Silicosis, J. A. M. A. 98:1439 (April 23) 1932.

1a. The text of this article was submitted in December 1938, and since that time our investigations have led us to add a fourth type of pneumoconiosis to those enumerated above. This type will be described in articles published almost contemporaneously with this one.

Nodular silicosis: chronic silicosis with typical nodulation, with or without dyspnea (South Africa).

Acute silicosis: acute silicosis without typical nodulation but with extreme dyspnea (Macdonald, Piggot and Gilder; Chapman).

By setting these types up one against another we are making no claim to originality.

Peribronchial or perivascular silicosis was roentgenologically recognized by Pancoast.[2] It is evidenced by peribronchial and perivascular deposits of collagen caused by small amounts of silica, or silica in combination with other elements, inhaled over a long period, and it may be evidenced further by an overdistention of the blood vessels. This type of lesion is frequently observed in subjects exposed to small amounts of silica, who may live to a ripe old age without dyspnea and die of some other disease but who in the meantime have peribronchial, perivascular lesions in the lungs even though they may not be, and in my opinion should not be, considered of a type that is "within the law."[3]

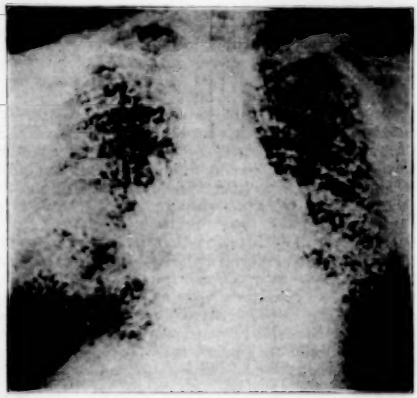

Fig. 1.—Illustration lent by Dr. Edward Klein of Perth Amboy, N. J. Exposure to silica in vitreous brick works. Both lungs are literally shot full of silicotic nodules composed of collagen whorls. The nodules are more or less discrete, but there are three massive groups in the right midlung field which resemble a pawnbroker's sign. This patient, however, had no dyspnea. As a matter of fact he had no symptoms, and it was only a suspected fracture of a rib following an automobile accident that led to the x-ray examination. The patient as well as every one else was surprised at the extreme degree of silicosis revealed. Since this patient had no dyspnea and yet did have marked nodulation in both lungs, it is evident that nodulation is not the cause of dyspnea.

Nodular silicosis is the common and universally recognized type of silicosis and is caused by a more intensive exposure to silica dust than is the peribronchial type. Nodular silicosis was defined by the Industrial Hygiene Committee of America[4] as "a disease due to the breathing of air containing silica, characterized anatomically by generalized fibrotic changes and the development of miliary nodulation in both lungs; clinically by shortness of breath, decreased chest expansion, lessened capacity for work, absence of fever, increased susceptibility to tuberculosis (some or all of whose symptoms may be present) and by characteristic roentgen ray findings. The disease is divided arbitrarily into first, second and third stages for convenience of description and possible compensation purposes."

Acute silicosis was described first by Macdonald, Piggot and Gilder [5] and later by Chapman.[1] We believe that it is manifested by a thickening of the walls of the alveoli. In some regions this thickening is caused by the laying down of small deposits of collagen, whereas in other regions it is caused by capillary dilatation. This type of silicosis is caused by an intensive exposure to silica or to silica in combination with other elements, probably alkaline elements. It terminates fatally within a short time and is therefore referred to as acute silicosis.

After making an intensive study of the pathologic changes of acute silicosis, we are convinced that dyspnea is caused by morbid changes in the blood and endothelial reticular structures, which in turn result in

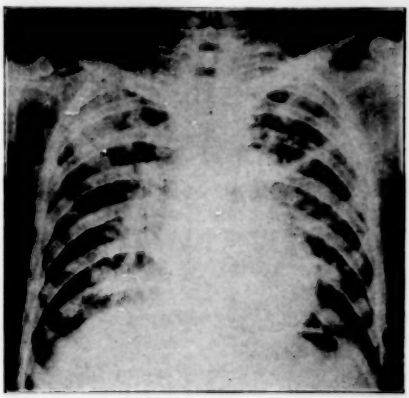

Fig. 2.—Illustration lent by Dr. Leonidas Harless of Gauley Bridge, W. Va. Exposure to intensive silica dust for twenty months. In this roentgenogram there is not a single shadow that could be definitely interpreted as due to a silicotic nodule. The roentgenologic appearances consist of a general haze or cloudiness of both lung fields, more marked at the right apex. Even those with great experience in the interpretation of roentgenograms of silicotic cases considered that roentgenograms similar to this were not due to silicosis because of the absence of the typical nodulation on which the diagnosis and definition of silicosis are based. Yet at the time of this examination the patient was in the late stages of silicosis with extreme dyspnea. Since the roentgenogram of this patient, who was in the last stages of silicosis with extreme dyspnea, manifests no nodulation, it is evident that one can have dyspnea without nodulation, and it therefore follows that nodulation is not the cause of dyspnea. Much of our pathologic evidence is based on a study of microscopic sections obtained from the autopsy in this case.

changes in blood cells, observed in localized regions of the lung. It is these all important but hitherto unrecognized changes which, in our opinion, explain the distressing symptoms of which the patient complains and which finally cause his death. It is our belief that cases of acute silicosis are by no means so rare as physicians have been led to think. Acute silicosis does not become chronic but chronic silicosis may become acute or may have acute exacerbations or an acute termination. The terminal stage of chronic silicosis may exhibit many of the manifestations of acute silicosis. We believe that

2. Pancoast, H. K., and Pendergrass, E. P.: Roentgenological Aspects of Pneumoconiosis and Its Medicolegal Importance, J. Indust. Hyg. **15**: 117 (May) 1933.

3. Bateman, G. C., in a paper read before the National Safety Council convention in which he quoted Dr. Smith, chairman of the Silicosis Appeal Board, South Africa.

4. Gardner, L. U.: Pneumonoconiosis, Internat. Clin. **2**: 16 (June) 1935.

5. Macdonald, G.; Piggot, A. P., and Gilder, F. W.: Two Cases of Acute Silicosis with a Suggested Theory of Causation, Lancet **2**: 846 (Oct. 18) 1930.

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much acute silicosis is not recognized clinically, roentgenologically or even pathologically as true silicosis, even by pathologists experienced in silicotic work.

In proof of this, we refer to Gardner's [6] report on the fifteen cases in West Virginia. Here were patients as "dead as door nails" from silicosis who manifested extreme dyspnea in spite of the fact that typical nodulation was not observed either roentgenologically or pathologically. Because of this absence of typical nodulation their condition was not considered the conventional type of silicosis, and Gardner referred to it as "so-called acute silicosis."

Acute silicosis as observed in these cases provided the key to the solution of the problem of silicotic dyspnea. This acute type of silicosis without typical silicotic nodules would surely be missed except by a silica-minded pathologist. We believe that many a patient who dies of acute silicosis is declared by the pathologist

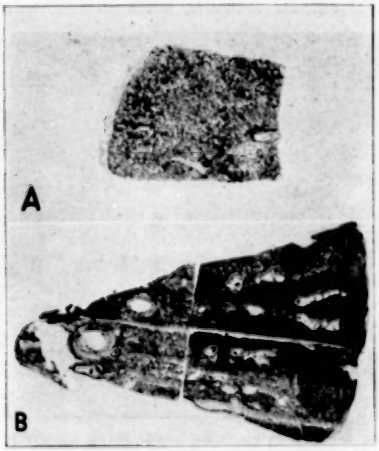

Fig. 3.—*A*, thumb section slightly larger than the usual thumb nail sections. As reproduced it is the actual size of the section. This is unsatisfactory for scientific study. *B*, section extending from the hilus to the pleura and composed of three sections mounted on one slide. Such a section enables one to correlate the pathologic observations with the regions in which they are observed.

to have had "unresolved pneumonia" without his even thinking of employing dark field examination of the lung section. This is particularly true if (*a*) a history of exposure to silica is unknown, (*b*) the patient was young and the disease of relatively short duration, that is less than two or three years, and (*c*) nodulation is not the outstanding change observed in the microscopic examination.

There are five regional manifestations of silicosis: (1) hilar, (2) peribronchial, (3) pleural, (4) interstitial and (5) parenchymal. For each of the five regions there are the following five types of pathologic change:

1. Flecks of silica and other foreign elements.
2. Phagocytes, some empty and some laden with silica and other elements.
3. Collagen laid down in patches in various patterns: (*a*) lamina, (*b*) whorls, (*c*) gobs, (*d*) fine fibrils.
4. Alveolar consolidation, varying in different regions: (*a*) alveoli may contain or be practically filled with phagocytes, (*b*) alveoli may contain homogeneous material with a stellate pattern ("cholesterol crystal clefts").
5. Morbid changes in the blood and endothelial reticular structures: (*a*) changes of the blood within the vessels, (*b*) changes in the endothelial reticular structures adjacent to the blood vessels.

The first four pathologic changes will be considered in greater detail in subsequent articles. The fifth, changes in the blood and endothelial reticular structures, is of first importance in an understanding of silicotic dyspnea and will be discussed in this article. As mentioned before, we believe that these changes are the chief cause of dyspnea.

An understanding of the normal anatomic and histologic structures of the lung is essential, but a description of these would be a digression from the subject under consideration. We shall simply refer to the bronchial tree as described by Huntington [7] and the terminal lobe as described by Miller [8] and describe a little more elaborately the capillary network in the walls of the alveoli, because these are the specific anatomic and histologic structures which are affected in the acute type of silicosis.

The walls of the alveoli are composed of a rich network of capillaries which is very much like the lattice work between two rooms. This lattice, or capillary network, is covered by thin, flat, squamous or shell-like cells of controversial type. These flat cells do not fit perfectly but have chinks between them. Lymphatic channels which have their origin in these chinks extend all the way to the hilus of the lungs, accompanying the blood vessels and bronchi, or those that are located just beneath the pleura may drain into the pleural cavity.

Just a word as to the preparation of the microscopic sections. The vast majority of microscopic sections of silicosis can be covered by a standard square cover glass about the size of one's thumb nail (fig. 3 *A*). Gardner refers to these as "thumbnail sections" and scorns them. One may make a diagnosis of silicosis on the basis of such a section if he is fortunate enough to have it include one or more silicotic nodules, but such sections are useless for a scientific, microscopic study of the disease. To be useful for scientific investigation or even for a simple negative diagnosis of silicosis, the microscopic section should be large enough to include a portion of the lung all the way from the hilus to the pleura.

No matter how big or how well cut such sections are, they are of no use if photographed in black and white. Large sections stained with the conventional hematoxylin and eosin (4) [9] are also unsatisfactory because of the poor tissue differentiations obtained; the collagen and muscle tissues and many other structures take on the same color, and the red blood cells are scarcely dis-

6. Gardner, L. U.: Pathology of So-Called Acute Silicosis, Am. J. Pub. Health **29**: 1240 (Dec.) 1939.

7. Huntington, George: The Eparterial Bronchial System of the Mammalia, Lancaster, Pa., New Era Printing Company, 1898.

8. Miller, William Snow: The Primary and Secondary Lobules of the Lung, Tr. Nat. A. Prev. Tuberc.

9. The numbers in parentheses hereafter refer to color photomicrographs. We believe that photomicrographs in black and white are useless to illustrate the pathologic changes herein described, and we are unwilling to submit inadequate proof of the observations made. Photomicrographs which prove these observations are on permanent exhibition at the office of the John B. Pierce Foundation, 40 West Fortieth Street, New York, and may be viewed at any time by appointment. We would welcome also an examination of the original microscopic sections with a record of each change and its position on the slide. We believe that these color photomicrographs are such that they can be projected readily on a screen for lecture purposes.

cernible (5).[10] On the other hand, adjacent serial sections when stained with trichrome give spectacular differentiation of tissue (6), particularly the collagen and red blood cells, and in some regions they are so brilliant that they remind one of a sunrise. We believe that any success we have had is due largely to the use of Masson's trichrome stain, and we are indebted to the late Miss Helen Gregory, technician in the department of surgical pathology at Columbia University College of Physicians and Surgeons, whose services were acquired through the courtesy of Arthur Purdy Stout, professor of pathology.

TYPES OF MORBID CHANGE

If a large, specially stained, microscopic section extending all the way from the hilus to the pleura is observed with a magnifying glass or its image is thrown on the screen (7), one sees the varying types of morbid change in different regions of the lung and notes the various regional manifestations of the disease. Some portions of the picture produced on the screen are as brilliant as the red sunrise in the east (8), whereas other portions are as drab as the morning western sky (9).

The sunrise areas are as red as blood, for indeed it is blood that gives the brilliant red hue to certain portions of the section. The drab sections, on the other hand, are singularly free from blood. In fact, one may examine field after field microscopically without observing a single red blood cell. Strange as it may seem, it was the avascular area, or region of the drab, leaden sky, which became the most interesting portion of the microscopic section. It is also amazing that, while the absence of red blood cells was noted early, it was not until after more than a year of intensive, hour after hour, day after day study of brilliantly stained sections that this observation became significant. Even more surprising is it that when the slides were presented to a silica-minded pathologist and he was asked "What is the matter with this picture?" he too failed to recognize the singular absence of red blood cells.

When the large avascular areas are once noted, it is observed that in certain regions the line of demarcation between the brilliant red sunrise and the drab sky is so clear cut and well defined that half the microscopic field may contain an overabundance of red blood cells while the other half remains drab and almost entirely free from them (10).

The normal alveolar wall, composed of a lattice work of capillaries, contains only a small amount of collagen. Certainly this amount of collagen does not distort, constrict or contract the lumens of the capillaries, and the blood circulates through the capillaries freely. The lumens of normal capillaries are adequate for the transmission or circulation of the red and white blood cells. In these normal capillaries the red blood cells are observed from various angles, some being seen in profile, others full face and others obliquely (11 and 12).

Large microscopic sections of the silicotic lung show three general manifestations of morbid change: (*a*) avascular areas (9), (*b*) overvascular areas (8) and (*c*) a region of invasion where the relatively normal lung is becoming avascular (10). In general we believe that the most completely avascular areas are in the midlung field, that the overvascular areas are adjacent regions, which may extend all the way from the pleura to the hilus, and that the most normal region of the parenchyma of the lung lies just beneath the pleura.

For the sake of simplicity in presenting our observations in these areas and in considering the sequence of pathogenesis in the lesion, we shall take up the third general manifestation first, as observed at the line of invasion, where the more normal portion of the lung begins to become avascular.

The Line of Invasion.—All portions of the lung show marked manifestations of silicosis by a laying down of collagen in one pattern or another. The collagen is laid down in the walls of the alveolus in such a way as to encroach on the capillaries, causing diminution or occlusion of their lumens. It is the presence of this collagen and the manner in which it is laid down in which one is interested. In certain regions of the section the walls of the alveoli may be thickened without completely obstructing the flow of the blood through the capillaries (13), but in other regions, perhaps because of more collagen or perhaps because of the manner in which it is laid down, the capillary circulation is interfered with. The collagen fibrils in the alveolar wall press on or compress the capillaries and diminish their lumens so that the red cells are caught in a traffic jam. That is, one red blood cell gets blocked in transit through a constricted capillary and other red blood cells pile up against it, much as coins are stacked, giving a typical rouleau appearance (14).

There is a film of serum between these red blood cells, so that they resemble a spinal column with the intervertebral spaces occupied by this film (15). If one red blood cell is compressed on one side, wedge shaped, the adjacent red blood cell changes its shape to fit, much as vertebral bodies change in Kümmel's disease of the spine. This indicates that the red blood cells have been trapped there for some time.

Individual cells caught in the constricted capillaries are sufficiently aerated by their adjacent alveoli so that they retain their viability, even though they are slightly deformed or compressed, and take the red stain brilliantly. Red blood cells in the arterioles and in the small arteries proximal to the constricted capillaries still retain their normal shape, but they do not take the red stain brilliantly; instead they take a dirty reddish brown color.

At the point where the normal capillaries become constricted in the line of invasion one observes the most interesting and convincing change, a single constricted capillary forming a part of an alveolar wall and a normal-sized capillary filled with a moderate number of red blood cells forming another part of the same wall (16). All the section adjacent to the normally filled capillary is composed of well vascularized tissue, whereas all the section adjacent to the constricted capillary is avascular and may not contain even a single viable red blood cell.

Avascular Areas.—The walls of the alveoli are tremendously thickened—they may be from five to ten times as thick as the normal alveolar wall—and are composed of (*a*) increased amounts of collagen laid down in small fibrils in the chinks between the flat cells of controversial origin which line the alveoli, or similar deposits of collagen in the spaces around the

10. L. U. Gardner published an intensive study of Fifteen Cases (Pathology of So-Called Acute Silicosis, Am. J. Pub. Health 23:1240 [Dec.] 1933). His article should be studied in conjunction with the observations herein recorded on material obtained from the same source. The sections which we have prepared for some of the subjects who were exposed to the same dust hazard as Gardner's subjects showed pathologic changes so characteristic that when Gardner saw them he said "I know where those came from," indicating that the sections studied represent a good cross section of the fifteen cases on which his report was based.

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capillary network (17); (*b*) large mononuclear cells which predominate over all other elements (18) in the formation of the alveolar wall; (*c*) phagocytes, some protruding into the lumen of the alveoli while others are entirely within the wall (19); (*d*) an occasional single cell or small group of red blood cells stained slightly red or pinkish (20) and (*e*) hypertrophied cells of controversial origin which line the alveoli (21).

The capillaries in the alveolar wall are so constricted or compressed by the adjacent collagen that they are unrecognizable and do not contain a single red blood cell. Red blood cells in the small and large blood vessels all the way back to the hilus in the avascular areas are disintegrated beyond all recognition (22, 23, 24, 25); they appear as reddish brown amorphous material. One may observe field after field without seeing a single vital red blood cell either in the constricted capillaries or in the arteries that supply the region or the veins that drain it (26).

Back close to the hilus at the branching of the larger arteries, one branch is observed to contain this amorphous material of disintegrated blood cells and fibrin, whereas the other branch contains normal red and white cells with only an occasional fragment of amorphous material (27). Such fragments have apparently broken off from the amorphous material. They do not plug the circulation of other red blood cells in the arteries in which they are lodged.

Overvascular Areas. — Overvascular areas (28) account for the brilliant red sunrise and present a direct contrast to the drab avascular areas. The alveolar walls between adjacent alveoli in the overvascular areas are thicker than normal, but they are composed of tissues radically different from those in the avascular areas. 1. The collagen elements are present but they are very scanty compared with the collagen elements in the avascular areas and are less numerous even than in the more normal regions of the section. 2. The thickened wall fails to contain a single cell with the large, brown-stained nucleus, in contradistinction to the abundance or overproduction of such cells in the avascular areas. 3. Phagocytes are singularly absent in the walls of the alveoli, although a few may be observed occasionally in the lumens. 4. The thickened wall contains a tremendous number of red blood cells—eight or ten times as many as normal—which are viable and stain brilliantly red. (Within the lumens of the alveoli there are large flakes of homogeneous material which stain bluish gray, and the alveoli in these regions contain a far greater amount of air than the alveoli in the avascular areas.) 5. The cells of controversial origin which line the alveoli are so thin and attenuated that they are scarcely recognizable. This is in direct contrast with the markedly thick and proliferated cells, many of which are desquamated, in the avascular area.

The capillaries may be dilated to eight or ten times their normal diameter and contain the overabundance of red blood cells just described. This marked increase in the number of red blood cells is the change which renders the overvascular region of the morning sunrise so brilliantly red. The immense dilatation of the capillaries allows far more than the normal number of red blood cells to circulate through the lumens of the capillaries. This is in direct contrast with the traffic jam in the avascular area. The free flow of the red blood cells through the dilated capillaries allows them to retain their normal shape in contrast to those caught in the traffic jam, where one red blood cell presses on another in such a way as to deform it.

The aeration of the red blood cells as they flow through the dilated capillaries is problematical. Varying quantities of red blood cells are seen in the alveoli adjacent to the dilated capillaries. In some regions there are only a few red blood cells in the alveoli (29), but in other regions the seepage is so great as to fill completely adjacent alveoli, causing an area of hemorrhagic consolidation (30). The red blood cells observed in the dilated capillaries, the arteries supplying them and the veins draining them are viable and take the red stain brilliantly (31, 32, 33, 34).

CAUSES OF SILICOTIC DYSPNEA

Theoretically dyspnea has been explained by two pathologic factors: (1) nodulation and, later, massive interstitial fibrosis and (2) alveolar consolidation. To these we add a third, capillary obstruction and dilatation.

Nodulation may diminish the lung somewhat, but the fact that nodulation is not the prime factor in the cause of dyspnea is shown by two facts: (1) nodulation may be present in extreme quantities without dyspnea, as in the case of fractured ribs, and (2) dyspnea may be present to an extreme degree without nodulation, as in acute silicosis. When dyspnea is present to an extreme degree there may be nodulation, but this may be so slight that the condition has been referred to as "so-called acute silicosis" when described by a silica-minded pathologist. It is true, however, that in an advanced stage of nodular silicosis dyspnea may be caused by so-called massive fibrosis which interferes with the expansion and contraction of the lung.

One of the accepted causes of the dyspnea of silicosis is alveolar consolidation. This consolidation is caused by a collection of various materials within the alveoli. These may contain or even be filled with (1) phagocytes, either empty or silica laden; (2) a more or less homogeneous, amorphous material, often with a stellate pattern (Gardner's "cholesterol crystal clefts"); (3) red blood cells, sometimes in hemorrhagic consolidation, and (4) hypertrophied, proliferated and desquamated cells that originally lined the alveoli.

Even this alveolar consolidation, however, is caused by capillary obstruction, which interferes with the regular itinerary of the phagocytes, preventing new ones from entering and old ones from escaping. In other words, we maintain that most of the dyspnea of silicosis is caused by circulatory disturbance rather than by mere diminution of the ventilation of the lung.

PATHOGENESIS OF SIL'COSIS

From an intensive study of the various sections of the jigsaw puzzle, and by the fitting together of these sections, a conception of silicotic pathology has developed which implies the following pathogenesis: Foreign body flecks composed of silica and other elements that have been inhaled are deposited on the walls of the alveolus. Phagocytes mop up these flecks and engulf them—with amebic hospitality. When the phagocyte becomes laden with silica, it works its way through the chinks between the cells lining the alveoli and comes in contact with the walls of the capillary network, and thence it moves along the lymphatic channel, either toward the hilus or toward the pleura. In its progress it leaves a trail in the form of fine

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fibrils of collagen. These fibrils compress or contract the adjacent capillaries in the walls of the alveolus, so that the red blood cells have difficulty in circulating through them. Eventually they cause a contraction of a capillary wall, so that a red blood cell becomes caught and others pile up against it, forming the traffic jam referred to. At first these red blood cells find methods of detouring, but finally even the alleys and side streets are so constricted by collagen fibrils that it is impossible to get through. The red blood cells that form the traffic jam remain viable because they are oxygenated by the air in the adjacent alveolus. As the capillaries become obstructed the blood is dammed back into the arterioles and eventually into the smaller and larger arteries all the way back to the root of the lung. The red blood cells in the smaller and larger arteries and veins have died and become disintegrated because they were not located sufficiently close to the alveoli to enable them to become oxygenated. The hypertrophy and proliferation is another contributing pathologic factor accounting for silicotic dyspnea. (The hypertrophy and proliferation of the thin cells of controversial origin lining the alveoli is similar to the hypertrophy and proliferation in the same type of cell when it is exposed by contact to tubercle bacilli. Therefore this phase of the pathogenesis of silicosis resembles an early phase in the development of the miliary pulmonary tubercle.) The avascularizing process occurs in relatively large areas of the lung, and these areas are rendered functionally useless.

While this avascularizing process is going on in certain large areas of the lung, the direct antithesis is occurring in other large areas, which become overvascularized, perhaps as a compensatory process, as evidenced by dilatation of the capillaries. Because of this free circulation of the blood, the red blood cells are normal and viable and take a brilliant red stain, but blood flows through the dilated capillaries in such large quantities that it is doubtful whether it is well oxygenated.

In view of these observations we are convinced, first, that nodulation, the pathologic change on which the diagnosis and definition of silicosis has been based, is not the prime factor in silicotic dyspnea, and, second, that capillary obstruction, either as an entity or combined with alveolar consolidation, as observed in acute silicosis or as an acute manifestation of the late stages of chronic silicosis, is the chief pathologic factor which causes dyspnea. We believe that the dyspnea of silicosis is principally due to occlusion of pulmonary capillaries in large, localized regions of the lung, with compensating capillary dilatation in other regions. In cases of acute silicosis in which there is massive exposure to certain types of silica, perhaps in combination with some other elements, capillary occlusion is spectacularly present. In cases in which the irritant has less silica and a preponderance of other elements, radically different circulatory disturbances have been observed, but these are too extensive and complicated to be included in this article.

These statements have been made after an intensive study of a limited number of cases of silicosis, but circulatory changes seem to have played an important part in one way or another in practically all the cases that we have observed. An analysis of the roentgenologic evidence and an attempt to correlate this with the pathologic evidence has strengthened our conviction that there are three types of silicosis, as mentioned earlier in this article. A more recent survey seems to indicate also that these types vary in frequency in different localities.

SUMMARY

Dyspnea is the outstanding symptom of silicosis, but it has not been accounted for by hitherto recognized pathologic changes. It is frequently absent in cases of marked nodulation and is, on the other hand, present in cases of indefinite nodulation.

A consideration of silicosis under the three types previously recognized—peribronchial, nodular and acute—aids in the comprehension of this problem. The acute manifestation, as observed in the Gauley Bridge cases, gave the key to this silicotic problem.

Large sections from the hilus to the pleura stained with Masson's trichrome stain were most valuable in enabling us to make the observations reported. Black and white photomicrographs were useless, and hematoxylin and eosin stain was also unsatisfactory.

Large microscopic sections of silicotic lungs show three general manifestations of morbid change: (1) avascular areas, (2) overvascular areas and (3) a region of invasion.

The region of invasion, where collagen consfricts the capillaries, is the most important region for intensive study. In the avascular portion, capillary occlusion by external pressure causes a traffic jam of red blood cells, with a damming back of the blood into the arterioles and a lack of drainage of the veins. The blood in the larger vessels in the avascular areas disintegrates. Overvascular areas, where there is immense dilatation of the capillaries and engorgement of the veins and arteries with viable red blood cells, seem to compensate for avascular regions in different portions of the section.

Theoretically dyspnea has been explained by two pathologic factors: (1) nodulation and (2) alveolar consolidation. To these we add a third, capillary obstruction and dilatation.

From a study of microscopic sections we have made certain deductions which constitute our conception of the life history of silicosis at least as it occurs in some groups of cases. We believe that the dyspnea of silicosis is due to capillary occlusion in large localized regions of the lung, with compensating capillary dilatation in other regions.

Most diseases exhibit morbid changes which can be recognized in relatively small sections, for example certain types of neoplasm can be determined by small groups of characteristic cells, but in silicosis there is a vast variety of morbid changes in various portions of the lung. Different varieties of dust result in different types of morbid change in varying regions of the lung.

40 West Fortieth Street.

Beverages in Reducing Diets.—The amount of fluids which stout persons should drink is greater than that which normal people need. When the obese are reducing weight, plenty of water is also needed. They should drink 3 to 5 pints of fluid daily. This amount can be taken without discomfort provided that drinks are spaced properly throughout the day. Most of it should be taken between meals, i. e., before breakfast, about 11 a. m., about 4 p. m. and before retiring to bed. A limited amount, say a tumblerful, at meal times is quite justifiable, since it aids digestion by softening food.—Christie, W. F.: Ideal Weight: A Practical Handbook for Patients, London, William Heinemann, 1938.

Clinical Notes, Suggestions and New Instruments

DIABETES MELLITUS COMPLICATED WITH LYMPHATIC LEUKEMIA

REPORT OF A CASE WITH AUTOPSY

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Diabetes and leukemia are rarely found associated in one case. By 1928 Wright [1] had collected four cases from the literature and added one of his own. In 1936 Elman and Marshall [2] recognized a terminal acute leukemia in a patient suffering from anemia of the pernicious type complicated with diabetes. Joslin in 1937 [3] reported six cases in his own practice. We hereby present a case with autopsy of lymphatic leukemia occurring ten years after the onset of mild diabetes.

According to Wright in 1928 three of the four cases then reported were of the myeloid while his case was of the lymphoid type. The case of Elman and Marshall was diagnosed as lymphoid, while Joslin had four of the lymphoid, one of the monocytic and one of the myeloid type. Our case was of the lymphoid type.

In six of the thirteen cases diabetes was known to have preceded the leukemia, and the period ranged from four months to twenty-two years.

Our case represents the sixth on record to come to autopsy.

REPORT OF CASE

Mrs. S., aged 51, was admitted to the New York City Hospital Nov. 26, 1938, for diabetes and lymphatic leukemia. In 1924 she injured her foot and was operated on in Bellevue Hospital. In 1928 a complication set in and she returned to Bellevue to have the leg amputated. At that time diabetes was discovered. After that she went on a fairly strict diet and made periodic visits to a private physician. According to her statement, she never showed sugar in the urine, though her blood sugar was always found to be in the diabetic range. She had never taken insulin.

In March 1938 she had hemorrhages in both eyes and became blind in the right eye with very poor vision in the left. Six months before admission great weakness developed with loss of appetite and a loss of 28 pounds (12.7 Kg.) in three months.

On examination there was a slightly enlarged liver and a spleen that showed a definite increase in size. There was a generalized lymphadenopathy.

There was a consistent fall in the content of hemoglobin from 50 per cent in October 1938 to 35 per cent in January 1939, with a corresponding diminution of erythrocytes from 2.75 to 1.7 millions. The leukocytes always remained high, from 350,000 to 600,000. The lymphoid cells varied from 88 to 100 per cent with some lymphoblasts always present. When granulocytes were found they were sometimes adult and sometimes young. An occasional eosinophil could be seen. The erythrocytes showed microcytosis, anisocytosis and polychromia. Platelets were diminished in number and the color index was between 0.8 and 0.9.

She was put on a diet of 1,575 calories with 150 Gm. of carbohydrate, 75 Gm. of protein and 75 Gm. of fat. December 1 her fasting blood sugar was 93 mg. per hundred cubic centimeters. December 3 and 6 there was sugar in the urine. The fasting blood sugar December 19 was 114 mg. Sugar tolerance tests with 100 Gm. of dextrose done Jan. 9, 1939, were 114, 154, 210, 222 and 182 mg. On the 12th the urine was positive for sugar. On the 14th the diastase of the urine was 6.6 and that of the blood was 3. The blood cholesterol was 143 mg. and the cholesterol esters were 75 mg. per hundred cubic centimeters.

From the First Medical Service and Pathological Laboratory, New York City Hospital, Welfare Island, Department of Hospitals.

1. Wright, F. R.: Diabetes Mellitus and Leukemia, Clifton M. Bull. **14**:1 (Jan.) 1928.
2. Elman, Claude, and Marshall, Stanley: Anaemia of Pernicious Type Complicated by Diabetes Mellitus and Termination in Acute Myeloid Leukemia, Lancet **2**:1094-1096 (Nov. 7) 1936.
3. Joslin, E. P.: The Treatment of Diabetes Mellitus, Philadelphia, Lea & Febiger, 1937.

January 18 an estimation of glycolysis was done on whole blood kept at room temperature.

Dextrose was found in the urine January 24 and lactose, pentose and maltose were ruled out. She died January 27.

PATHOLOGIC REPORT

Only the pertinent conditions found are reported.

The axillary and inguinal nodes were enlarged, soft and discrete. The general adenopathy was the most prominent sign of the gross examination. The tracheobronchial nodes were slightly enlarged, soft and deeply pigmented with carbon. All the other nodes of the body, aortic, iliac and mesenteric, were enlarged, soft and discrete and the cut surfaces were fleshy and homogeneous. The spleen was greatly enlarged and likewise soft, homogeneous and fleshy in appearance. The heart appeared tigroid. The other organs presented no macroscopic changes.

The glands and spleen presented the same appearance, a diffuse sheet of fairly homogeneous lymphoid cells. Leukemic infiltration was present in the heart, liver and peripelvic renal fat.

Estimation of Dextrose in Whole Blood January 18

Time p. m.	2:30	3:30	4:30	5:30	6:30
Dextrose, mg. per 100 cc.	145	129	121	114	105

The pancreas was completely free of leukemic infiltration. The islands of Langerhans appeared very scanty but those present were quite normal in appearance.

The other organs were normal, the only change being the large numbers of lymphoid cells in the vascular bed.

The anatomic diagnosis was diabetes mellitus and chronic lymphoid leukemia.

COMMENT

At first the history of the diabetes suggested a possibility of error in diagnosis. It was thought that with so few positive urinary specimens in ten years it might not be diabetes mellitus but pentosuria or some other condition of sugar excretion. The diabetic type of blood sugar curve following a dextrose tolerance test, however, established the fact that the carbohydrate metabolism was at fault and more than likely of a diabetic nature. There was no sugar excreted in the urine during the test, and no reducing substances were found thereafter until the diet was raised to high carbohydrate values. The exact amount of sugar intake was difficult to estimate, as she refused many of her feedings and vomited many more. It was only after she was put on an exclusively fruit juice regimen that sugar occurred in the urine. This was shown to be dextrose first by fermentation, which eliminated pentose, and then by Barfoed's reagent, which gave a positive reaction and eliminated maltose. The diagnosis of diabetes mellitus was then confirmed and the degree shown to be mild enough for control by slight restrictions in the diet.

Because leukemia and diabetes are so rarely found together, it was thought that some factor in the blood might be responsible. With this in view, the glycolytic rate of the blood was investigated. It is a well known fact that the blood sugar will gradually disappear when blood is allowed to stand in vitro. The reaction is influenced by the temperature of the blood. Cold retards it and heat hastens it, while it ceases if the blood is heated to 58 C. It occurs only in the presence of blood cells, especially of white blood cells.[4] According to Schmitz and Glover [5] the normal rate is from 15 to 23 mg. per hundred cubic centimeters of blood an hour. They reported that the glycolysis was more rapid in myelogenous leukemia, in which it may be 84 mg. The rate was parallel to the number of white blood cells, though they thought that the rate was dependent on the number of immature forms. They did not believe that the initial concentration of dextrose affected the rate of glycolysis in the normal or in the leukemic blood. Denis and Giles [6]

4. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams and Wilkins, 1931.
5. Schmitz, H. L., and Glover, E. C.: Glycolysis in Leukemic Blood, J. Biol. Chem. **74**:761 (Sept.) 1927.
6. Denis, W., and Giles, C.: On Glycolysis in Diabetic and Non-diabetic Blood, J. Biol. Chem. **58**:739 (July) 1923.

found glycolysis in normal blood much more active than in the blood of persons suffering from severe diabetes. Tolstoi[7] disagreed with this, concluding that the two were the same when kept at a temperature of 37 C.

The rate of glycolysis in a specimen of whole blood which contained 600,000 white blood cells and many immature forms was determined for hourly periods up to the fourth hour. The specimen as taken showed 145 mg. of sugar per hundred cubic centimeters. At the end of the first, second, third and fourth hours it was 129, 120, 114 and 105 mg. respectively. This appears to be about normal.

The aforementioned data relate to the blood in vitro. It seemed possible that conditions in the blood during life might be different. We therefore investigated the blood sugar values of the last fifteen admissions of leukemia to the New York City Hospital for which there were records of fasting blood sugars. These showed a range from 80 to 174 mg. per hundred cubic centimeters. There was no difference between the myeloid and the lymphoid types.

The pancreas was examined in three of the earlier reported cases and no evidence of lymphatic infiltration was found. We were likewise unable to find any lymphatic infiltration in our case.

CONCLUSIONS

It would seem that the occurrence of diabetes and leukemia at the same time is very rare. The number of cases found is far below what would be expected from the rate of occurrence of these diseases individually.[1] In the majority diabetes precedes leukemia. The three types of leukemia are represented, though the lymphoid type is much the more common.

The rate of glycolysis was no different from that in normal blood. It could be said that the rate was unaffected by the excessive number of lymphoid cells or by the large amount of immature forms. Furthermore, it was shown that the blood sugar values in patients with leukemia without diabetes are within the normal range.

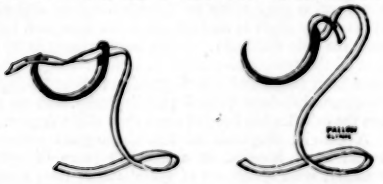
No explanation can be made, therefore, of this relationship between diabetes mellitus and leukemia from the evidence at hand.

939 Woodycrest Avenue.

HERNIA: ATTACHMENT OF FASCIAL STRIP TO GALLIE NEEDLE

JOHN FALLON, M.D., WORCESTER, MASS.

Fastening the fascial strip to the Gallie needle by suture or ligature wastes time and crushes the end of the strip enough to make it a foreign body. After watching me try various mechanical fasteners only to discard them, my operating room



Steps in attachment of fascial strip to Gallie needle.

supervisor Sister Mary Clare suggested the obvious solution sketched here. For smooth passage the loop should follow after the needle, not be wrapped round the eye. Use of this loop for two years has shown several advantages and one disadvantage: it does not hold against a strong pull. But fascial strips should not be subjected either to tension or to ungentle surgery.

390 Main Street.

7. Tolstoi, E.: Glycolysis in Bloods of Normal Subjects and of Diabetic Patients, J. Biol. Chem. 60:169 (May) 1924.

From the Fallon Clinic.

Special Clinical Article

THE DIAGNOSIS AND MANAGEMENT OF CHRONIC OBLITERATIVE VASCULAR DISEASE

CLINICAL LECTURE AT ST. LOUIS SESSION

LELAND S. McKITTRICK, M.D.
BOSTON

During the ten year period from 1929 to 1939, 288 patients have been under the care of the members of the Peripheral Vascular Clinic at the Massachusetts General Hospital for the treatment of obliterative arterial disease due either to thrombo-angiitis obliterans or to peripheral arteriosclerosis. Between May 1923 and Jan. 1, 1939, 565 patients with arteriosclerotic gangrene associated with diabetes mellitus have been operated on by my associate Dr. Theodore C. Pratt and myself at the New England Deaconess Hospital. The disease of these patients was so advanced as to warrant their admission to the wards of either hospital. From a review of the records of these patients we shall try to summarize the problems in diagnosis and hospital treatment which this group presents.

SYMPTOMS AND SIGNS OF OBLITERATIVE ARTERIAL DISEASE

History.—The symptoms of progressive occlusion of the arterial supply to an extremity are similar regardless of the nature of the obliteration.

Intermittent claudication is one of the earliest and most common of these symptoms. It is variously described as a discomfort, lameness or at times a true cramp, which may be felt through the arches of the foot, in the calf of the leg or even in the muscles of the thigh or of the gluteal region. It is brought on by walking and is relieved by rest. Not infrequently the reference of discomfort to the arches of the foot is responsible for prolonged orthopedic treatment under the mistaken impression that the pain is due to faulty mechanics of the foot rather than to inadequate blood supply. This symptom may be a prominent part of the presenting complaint or it may be elicited only on careful questioning. Rest pain is usually a late symptom, though in patients suffering from thrombo-angiitis obliterans it is almost always present by the time hospitalization has become necessary. Paresthesias, such as coldness, numbness or burning, are often present. The burning at times may be so extreme that even the weight of a bed sheet cannot be tolerated. Some minor trauma or infection in a corn or around a nail is the usual precipitating factor which brings these patients to the hospital.

Physical Manifestations.—As a diagnosis sufficiently accurate for proper therapy can be made on a basis of careful clinical examination, no attempt will be made to discuss the more intricate procedures or mechanical means of evaluating the degree of vasospasm or of arterial obliteration.

The patient should be lying in bed or on a table. Both legs should be bared to the midthigh and should be

From the Peripheral Vascular Clinic of the Massachusetts General Hospital and the Diabetic Service at the New England Deaconess Hospital.
Read in the Medical Division of the General Scientific Meetings at the Ninetieth Annual Session of the American Medical Association, St. Louis, May 16, 1939.

exposed to the room temperature for a period of from ten to fifteen minutes before the examination is carried out. To the experienced eye a comparison of the two extremities will give important information. The more normal the appearance of the foot, whether horizontal, elevated or dependent, the more normal is the arterial supply to that foot, whether it is through main arteries or through extensively developed collateral supply. A foot with deficient arterial supply is a foot deficient in oxygen and nutrition. Atrophy of the muscles and subcutaneous fat of the foot or calf, thin, brittle nails, a parchment-like skin or trophic changes at the tip of one or more digits are commonly noted. At times the foot and toes are a little swollen and full, though without actual pitting edema. On elevation, particularly if the foot is moved vigorously at the ankle, as suggested by Samuels,[1] blanching rapidly occurs; the veins in the foot collapse and it assumes a cadaveric hue. With the patient in a sitting position and the legs hanging over the edge of the bed, the gradual return of color is followed by the appearance of a marked rubor or cyanosis which may involve the toes alone but which may extend to, but rarely above, the junction of the upper and middle thirds of the lower part of the leg. The superficial veins fill slowly and then become tense and distended. Gross changes in skin temperature may be elicited with the examiner's hand. Beginning above the knees, different levels of the same leg and similar levels of the two legs are compared; a gradual or a sudden temperature change may be noted and this level will frequently coincide with that of color change.

Palpation of the dorsalis pedis, anterior tibial, posterior tibial, popliteal and femoral arteries to determine the presence or absence of pulsation is a most important part of the examination not only in relation to the diagnosis of obliterative disease but more particularly as a guide to treatment. The oscillometer is useful in confirming the presence or absence of pulsation in the main arterial channels or in eliciting a change in its character. It has not been of great help to us in interpreting the actual blood flow to the limb, especially through collateral vessels, and has been of little practical value in the actual management of these cases. The blood pressure cuff, inflated to slightly above diastolic pressure, serves as a practical method of comparing the oscillations at various levels of the same leg and at similar levels of the two legs.

Roentgenographic examination of the vessels to determine the presence or absence of calcification may be of value in differentiating between thrombo-angiitis obliterans and arteriosclerosis. It is however of no value in determining the adequacy of the lumen of the vessels and is therefore valueless as a factor in determining the level at which amputation, if necessary, should be done.

Spinal anesthesia, procaine block of one or more sensory nerves, and typhoid vaccine intravenously are used to determine the presence or absence of vasomotor spasm and are used rather to evaluate a possible ganglionectomy than as diagnostic procedures.

DIFFERENTIAL DIAGNOSIS

Thrombo-angiitis may be described as a generalized disease involving both arteries and veins. It is most frequently associated with pathologic changes of the peripheral vessels but may involve those of the mesentery, heart, cerebrum and other viscera. The disease is usually chronic and, if untreated, progressive; but it may be of an acute fulminating type with symptoms of short duration and rapidly spreading gangrene necessitating early high amputation.[2] There is early diminution in or disappearance of pulsation in one or all of the peripheral arteries to the foot. Later the popliteal and not infrequently even the femoral artery may be obliterated. These patients have an extraordinary ability to develop a collateral circulation early, so that not infrequently one may see a patient with a useful foot entirely dependent on the collateral supply below the level of the groin.

TABLE 1.—*Age at Onset of Symptoms.*

	Thrombo-Angiitis Obliterans	Arterio-sclerosis	Diabetic Gangrene *
Under 20	1	0	0
20-29	22	0	0
30-39	44	3	0
40-49	31	8	10
50-59	11	47	52
60-69	0	68	150
Over 70	0	50	119
Not stated	3	0	14
Total	112	176	345
Average age at onset	39 years	68.2 years	66.5 years

* This includes all diabetic patients admitted to the New England Deaconess Hospital from Jan. 1, 1935, through Dec. 31, 1938, with gangrene of either extremity, whether operation was required or not.

Thrombo-angiitis is a disease of the young and middle aged (table 1) and the symptoms are of years' rather than months' duration before the patient becomes urgently in need of treatment (table 2). It is not limited to any race and is rarely seen in a woman.[3] The lower extremities are usually the first to be involved, one at a time, but only rarely is the disease limited to one foot. Involvement of the upper extremities is not uncommon but has occurred in only 24.2 per cent of the cases under consideration.

Migrating phlebitis occuring as small, tender, red, firm areas along the superficial veins of the extremities, not following the course of any one vein, is pathognomonic of the disease.

Calcification of the arteries demonstrable by x-ray examination may occur in thrombo-angiitis obliterans. It is usually slight in amount and is the exception rather than the rule (table 3). It has been present in 10 per cent of the twenty-nine cases in which roentgenograms have been taken and the diagnosis of thrombo-angiitis obliterans has been proved pathologically. In no case has the calcification been of more than slight degree.

A definite diagnosis of thrombo-angiitis obliterans would seem justified in a man 40 years of age or younger, with symptoms of years' rather than months' duration, without presence of calcification of his vessels on x-ray examination and with a normal content of blood sugar. A history of migrating phlebitis may or may not be present. A probable diagnosis may be made in a man between the ages of 40 and 55 with symptoms

1. Samuels, S. S.: The Early Diagnosis of Thrombo-Angiitis Obliterans, J. A. M. A. 99:1371 (May 11) 1929.

2. This acute form of the disease has been present in two of our cases. One patient aged 24 years, who entered with a history of one month duration, had a bilateral thigh amputation within nineteen months of onset and died suddenly three years after onset. A patient aged 32 years, who nearly died following a midthigh amputation three months after onset of symptoms, died at home two years after onset following ten days' illness, said to have been due to a gastric ulcer.

3. There is one questionable but no proved case of thrombo-angiitis obliterans in a woman in the records of the Massachusetts General Hospital.

of more than one year's duration who shows slight or no evidence of calcification by x-ray examination, particularly if there is evidence of involvement of an upper extremity. A diagnosis of thrombo-angiitis obliterans should rarely be made in a patient over 55 years of age, with or without demonstration of calcification of his vessels by x-ray examination and with a story of less than one year's duration at the time of his hospital admission. We should be unwilling to make a diagnosis of thrombo-angiitis obliterans in a woman unless she was 40 years of age or younger with a history of years' rather than of months' duration, without calcification on x-ray examination and with a normal blood sugar.

Arteriosclerotic gangrene is usually not difficult of diagnosis. It occurs at an older age (table 1), the symptoms are of months' rather than years' duration (table 2) and it affects both men and women, usually one leg at a time, but frequently it is or becomes bilateral. The upper extremity may be involved but rarely, only 7.4 per cent of 176 cases. Calcification is usually demonstrable by x-ray examination, although in 30 per cent of sixty-six proved cases such evidence was lacking. We believe that a diagnosis may be made with reasonable certainty in a patient 55 years of age or over with symptoms of less than one year's duration and with calcification of the vessels demonstrable by x-ray examination. As already described, it is impossible to make a positive diagnosis in a man between the ages of 40 and 55 with symptoms of approximately a year's duration and with little or no calcification on x-ray examination.

Arteriosclerotic gangrene associated with diabetes mellitus, while differing slightly from arteriosclerotic gangrene in nondiabetic patients, presents little in the way of a problem for diagnosis. It occurs in both men and women, is limited almost entirely to the lower extremities, and may appear at an early age (table 1). The symptoms are usually of short duration, but in many instances we have seen patients of whom a careful history has elicited symptoms of intermittent claudication years previously and the patient at the time of examination depended entirely upon collateral circulation below the level of the femoral. Other patients, such as in senile gangrene, have a short progressive history. We have for years been looking for a patient with diabetes and thrombo-angiitis obliterans and as yet we have found no such case either among the patients at the Massachusetts General Hospital or in the large group of diabetic patients who have come under our care at the New England Deaconess Hospital. We therefore feel justified in making a diagnosis of so-called diabetic gangrene for any patient, male or female, with definite evidence of obliterative arterial disease associated with diabetes mellitus.

TABLE 2.—*Duration of Symptoms*

	Thrombo-Angiitis Obliterans	Arterio-sclerosis	Diabetic Gangrene
Under 1 year	41	138	317
1-2 years	17	20	9
2-3 years	12	11	5
3-5 years	22	3	0
Over 5 years	17	4	0
Not stated	3	0	14
Total	112	176	345
Average duration	2.7 years	11.5 months	2.2 months

PRINCIPLES OF AND RESULTS AFTER TREATMENT

It is not within the limits of this discussion to go into the detail of or the reasons for the various therapeutic procedures used in the management of these cases. We can only refer to certain of the fundamental principles of treatment common to all forms of the disease, point out important variations in the response of the three different conditions already described and to the treatment available and emphasize the importance of carrying out certain procedures with a minimum of delay and with a maximum of care.

TABLE 3.—*Calcification of Arteries of Legs by X-Ray Examination in Proved Cases (Massachusetts General Hospital)*

	None	Slight	Definite
Thrombo-angiitis obliterans	89.7%	10.3%	0
Arteriosclerosis	30.3%	0	69.7%

All patients entering the hospital for treatment are given:

1. Bed rest. Sufficient medication is given to control pain. It is important that the resting position of the involved foot is such that the foot is not blanched (Buerger's [4] angle of circulatory sufficiency). Heat is avoided because of the inability of the circulation to respond to the increased demand for oxygen.

2. Careful hygiene. Careful examination of the feet is made for any evidence of epidermophytosis and if it is present active treatment is undertaken. In its absence or after it is controlled, the feet are massaged daily with hydrous wool fat. A small pillow is placed under the legs just above the heels so that there is no pressure to this vulnerable area. Handles are attached to a Balkan frame to facilitate movement in bed. In diabetic patients particularly, meticulous care must be given to the back.

3. General supportive measures such as iron for anemia, and a well balanced diet with adequate vitamin intake. Smoking is prohibited for patients with thrombo-angiitis obliterans, but only in isolated instances for patients whose process is due to arteriosclerosis with or without diabetes.

4. Buerger's postural exercises as modified by Allen,[5] unless contraindicated by lymphangiitis or spreading infection.

5. Intermittent venous hyperemia [6] based on the earlier work of Bier,[7] later confirmed by Lewis and Grant,[8] and recently introduced by Collens and Wilensky [9] is a practical method for the treatment of peripheral vascular disease.

By careful attention to details and by learning to live within the circulatory possibilities of their feet, many patients in the earlier stages of obliterative disease may avoid or at least postpone the onset of gangrene for many years by the simple methods that have been enumerated. In the more advanced cases, however, these simpler methods will be unsuccessful and more active

4. Buerger, Leo: Circulatory Disturbances of the Extremities, Philadelphia, W. B. Saunders Company, 1934, p. 163.
5. Allen, A. W.: New England J. Med. **204**: 859 (April 23) 1931.
6. An excellent review of intermittent venous hyperemia has been given by de Takats, Geza; Hick, F. H., and Coulter, J. S.: Intermittent Venous Hyperemia, J. A. M. A. **108**: 1951 (June 5) 1937.
7. Bier, A. K. G.: Virchows Arch. f. path. Anat. **147**: 256, 444, 1897. Bier, A. K. G.: Virchows Arch. f. path. Anat. **291**: 751, 1933.
8. Lewis, Thomas, and Grant, R. T.: Heart **12**: 73 (June) 1925.
9. Collens, W. S., and Wilensky, N. D.: Am. Heart J. **11**: 705, 721 (June) 1936.

procedures become indicated. The indications for and the response to treatment vary so markedly in the different conditions, they will be considered separately.

Thrombo-Angiitis Obliterans.—Every patient in this series with the diagnosis of thrombo-angiitis obliterans has had, at the time of admission, severe rest pain usually referred to the region of an open ulceration on one or more toes. To be successful, treatment must

TABLE 4.—*Major and Minor Amputation in 112 Cases of Thrombo-Angiitis Obliterans (Massachusetts General Hospital)*

Treatment	No. of Cases	Per Cent of Total	Mortality
No operation	19	17.0	0
Miscellaneous	30	26.8	0
Minor amputation only	28	25.0	3.6 per cent
Major amputation			
Single	23	20.5	0
Double	12	10.7	8.3 per cent
Total	112	100.0	1.8 per cent

(1) relieve pain, (2) produce a maximum of vasodilatation, (3) increase collateral circulation and (4) so far as possible retard the progress of the disease.

Smoking.—This is prohibited. Samuels[10] credits Michaels in 1909 with observing the effect of smoking. He and Silbert have for years stressed the important relationship between smoking and the disease, but not until Maddock and Coller[11] demonstrated the vasoconstriction associated with smoking was I convinced of the importance of complete cessation of smoking as fundamental in the proper treatment of this disease.

Nerve Block.—This was suggested by Silbert[12] in 1922 and popularized by Smithwick and White[13] and is used extensively. It is, I believe, one of the most valuable procedures available in the care of the more advanced stages of the disease. Not only does it give complete relief from pain but there is associated a vasodilatation in the denervated area lasting from four to seven months. It has been used in 27 per cent of our cases.

Lumbar Ganglionectomy.—Excision of the second and third lumbar ganglions has been used more in recent years than formerly. Increasing experience has suggested that the vasomotor index is frequently so low as to suggest little benefit from this procedure. The maintenance of a dry foot with maximum vasodilatation affords optimal conditions under which a collateral circulation may be developed and maintained. I now feel that it is indicated for a good risk patient with a cold, moist foot which under spinal or peripheral block becomes dry and improves in color, even though the actual increase of temperature may be of no more than a few degrees.

Minor and Major Amputations.—The earlier and more effective the treatment, the fewer will be the number of patients subjected to major amputation. I cannot go into the indications for operation at this time. Faxon,[14] in his study of this same group of patients, carefully considers this in his paper. It is, however, of extreme importance to realize that pain is no longer an indication for amputation in thrombo-angiitis obliterans and that septicemia is an extremely rare complication in this group. These patients are young, with their economic life ahead. Better a thorough trial at conservative treatment with minor amputation as indicated than a hasty decision for early amputation at a higher level without careful and thorough hospital treatment (table 4).

As frequent recurrences have been seen because of minor infections of a digit, we now do prophylactic amputations of the remaining toes of the affected foot in many of our cases after the patient's infection has been cleaned up and under the vasodilating influence of peripheral nerve block or sympathectomy.

Results.—It is our experience and that of Silbert, Samuels, Horton[15] and others that early and proper treatment, particularly if this includes complete and permanent cessation of smoking, will in many instances be followed by a definite arrest of the obliterative process at least over a period of years. Late or inadequate early treatment, however, will result in a distressing morbidity. Between Jan. 1, 1929, and Jan. 1, 1939, 112 patients have been treated in the wards of the Massachusetts General Hospital for this disease. Although there has been progressive improvement in our understanding and management of the disease, the frightful economic burden of these patients and the distressing morbidity of the disease remain a challenge to our knowledge and care. The marked discrepancy between the results obtained by us and those obtained by Silbert and Samuels is most impressive. Table 4 shows that 25 per cent of our patients have left the hospital after an amputation of one or more toes and that 31 per cent of the group have required a major amputation. This is in striking contrast to the 6.4 per cent of Silbert's 687 cases and to Samuels' report of one major amputation in 300 patients seen over an eight year period. We offer no explanation for this discrepancy. Horton[15] reports amputations in 22.5 per cent of his group of 948 cases observed over a thirty year period from 1907 to 1937.

TABLE 5.—*Major and Minor Amputation in 176 Cases of Arteriosclerosis (Massachusetts General Hospital)*

Treatment	No. of Cases	Per Cent of Total	Mortality
No operation	43	24.4	7 per cent
Miscellaneous	11	6.25	0
Minor amputation only	11	6.25	0
Major amputation			
Single	96	54.6	16.7 per cent
Double	15	8.5	6.7 per cent
Total	176	100.0	11.4 per cent

Arteriosclerotic Gangrene.—Many of these patients enter the hospital because of severe pain preceding the actual onset of gangrene. In most instances careful adherence to the conservative regimen that has been described will permit adjustment of the patient's circulation to his oxygen needs, and many of these patients may be carried along for the remainder of their lives without the actual development of gangrene. When gangrene has actually developed so that all or a part of one or more toes is involved, the outlook is much more serious than in thrombo-angiitis obliterans. Nerve block

10. Samuels, S. S.: Gangrene Due to Thrombo-Angiitis Obliterans, J. A. M. A. **102**: 436 (Feb. 10) 1934.

11. Maddock, W. G., and Coller, F. A.: Peripheral Vasoconstriction by Tobacco and Its Relation to Thrombo-Angiitis Obliterans, Ann. Surg. **98**: 70-81 (July) 1933.

12. Samuel Silbert (A New Method for Treatment of Thrombo-Angiitis Obliterans, J. A. M. A. **79**: 1765 [Nov. 18] 1922) gives credit for this procedure to Quénu (Clinic of Dr. Samuel Silbert: Amputations in Thrombo-Angiitis Obliterans, S. Clin. North America **18**: 389 [April] 1938).

13. Smithwick, R. H., and White, J. C.: Surg., Gynec. & Obst. **51**: 394 (Sept.) 1930.

14. Faxon, H. H.: Major Amputations for Advanced Peripheral Arterial Obliterative Disease, this issue, p. 1199.

15. Horton, B. T.: The Outlook in Thrombo-Angiitis Obliterans, J. A. M. A. **111**: 2184 (Dec. 10) 1938.

for the relief of pain is indicated only for the occasional patient with arteriosclerotic gangrene. Most patients who cannot be made pain free under three weeks of hospitalization as described will rarely have or develop circulation adequate to permit a satisfactory result following local amputation, and major amputation will usually be indicated. The element of vasospasm is not great and these patients are poor surgical risks, so that lumbar ganglionectomy has not seemed indicated. The

TABLE 6.—*565 Operations for Diabetic Gangrene (New England Deaconess Hospital)*

Treatment	No. of Cases	Per Cent of Total	Mortality
Minor amputation only	58	10.2	6 per cent
Miscellaneous	12	2.1	0
Major amputation			
Single	438	77.5	14.8 per cent
Double	57	10.1	7.0 per cent
Total	565	99.9	12.9 per cent

tendency to develop adequate collateral circulation or circulation sufficient to permit the successful accomplishment of a local amputation for gangrene is very slight (table 5). It is our experience that in most instances a patient with arteriosclerotic gangrene becomes an economic burden to his family or to the community, and the ultimate result after the appearance of gangrene does not justify a prolonged period of hospitalization in the hope of avoiding a major amputation except in the occasional case.

Diabetic Gangrene.—Gangrene in a patient with diabetes mellitus is a medical and surgical emergency. Its successful management requires the most meticulous attention to detail, early operation when and where indicated and carefully performed, plus complete cooperation with and from the medical components of the team. The mortality associated with amputation for gangrene is appalling. That excessive mortalities are unjustifiable and are the result of delayed or inadequate treatment, there can be no doubt. The average diabetic patient with gangrene is about 66 years old, he has had diabetes for eight years, and he has advanced arteriosclerosis. He has, in addition, a metabolic disease more difficult of control in the presence of infection and a lowered resistance to local and general infection. Between 5 and 6 per cent of the patients treated for gangrene without operation at the Deaconess Hospital have died of cardiovascular-renal disease. With a mortality of 10.5 per cent for all operations on the lower extremities of 883 diabetic patients at this same hospital, about one half of these, or 4.6 per cent of the entire group, have died of degenerative processes. With but few exceptions the difference between this mortality of approximately 5 per cent and our actual mortality is the mortality of delayed or inadequate treatment. This delay may be your responsibility as a practitioner, yours as an internist, or mine as a surgeon. It may be, and probably frequently is, that of the patient. Nevertheless it is a responsibility which you and I must accept and do all in our power to justify.

Approximately half of these patients admitted to the New England Deaconess Hospital are successfully treated without operation. Once gangrene has definitely developed so as to involve all or a part of the deeper structure of one or more toes of a pulseless foot, the chance of extending infection and possible death is greater than the chance of spontaneous amputation and permanent healing. Early decision of the level for amputation should be followed by an early and carefully executed operation. We have been able to do a successful removal of a gangrenous toe in only 10 per cent of our patients. When amputation at a higher level is necessary, that procedure assuring the greatest safety and shortest period of hospitalization is usually indicated. We therefore prefer amputation through the femur just above the condyles for most of these patients whose condition will permit primary closure.[16] For bad infections in patients badly depleted from long standing sepsis and untreated diabetes; in short, for any case in which in our judgment primary closure is unsafe, we employ a guillotine amputation usually through the lower leg. This has been necessary in only 6 per cent of our cases. In carefully selected cases, closed amputation through the lower leg or a Gritti-Stokes type of operation is done. We feel strongly, however, that either a lower leg or Gritti-Stokes amputation is justified only when the patient's general condition is sufficiently good to permit subsequent use of an artificial limb.

CONCLUSIONS

A review of the records of 112 patients with thromboangiitis obliterans and 176 patients with arteriosclerotic gangrene under the care of the Peripheral Vascular Clinic at the Massachusetts General Hospital, and 565 patients with diabetic gangrene under my care at the New England Deaconess Hospital suggest that:

1. Thrombo-angiitis obliterans is a disease of young and middle-aged men with symptoms of years' duration.
2. It is rarely seen in a woman.
3. Calcium deposits in arteries are only rarely demonstrated by x-ray examination and when present are slight in amount.
4. Certain cases in men between the ages of 40 and 55 may be indistinguishable clinically from cases of gangrene due to arteriosclerosis.
5. In spite of improvements in management of these cases, 30 per cent of our cases have come to major amputation.
6. Twenty per cent of sixty-six proved cases of arteriosclerotic gangrene failed to show calcium deposits in the arteries of the legs by x-ray examination.
7. Sixty-three per cent of 176 patients treated with a diagnosis of arteriosclerotic gangrene came to amputation through or above the lower part of the leg.
8. Early and adequate treatment of diabetic gangrene is of great importance.

205 Beacon Street.

16. Fifty-three per cent of 559 patients operated on by us for gangrene prior to Jan. 1, 1939, had primary closed thigh amputations with a mortality of 11.7 per cent (McKittrick, L. S.: *Am. J. Surg.* 44:46 [April] 1939).

Classification of Mental Diseases.—Three general diagnostic categories of mental disease are recognized: the organic psychoses, the functional psychoses and the psychoneuroses. The principal organic psychoses are senile dementia, cerebral arteriosclerosis, general paresis and the alcoholic psychoses. In these disorders there exists a known physical or organic basis. The principal functional psychoses are dementia praecox, manic-depressive psychosis, involutional melancholia and paranoia. To date, no demonstrable organic pathology has been shown in these psychoses, so that hereditary and constitutional factors are considered to be of chief etiological importance. The etiological factors in the psychoneuroses and in the psychoses allied with psychopathic personality are usually said to be psychogenic. —Landis, Carney, and Page, James D.: Modern Society and Mental Disease, New York, Farrar & Rinehart, Inc., 1938.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

LIEBEL-FLARSHEIM SW-221 SHORT WAVE GENERATOR ACCEPTABLE

Manufacturer: The Liebel-Flarsheim Company, 303 West Third Street, Cincinnati.

The Liebel-Flarsheim SW-221 Short Wave Generator is recommended for medical and minor surgical diathermy. It is furnished in an all metal semiportable cabinet with a separate subcabinet. Standard equipment includes inductance cable, cuff and pad electrodes and a treatment drum on a counterbalanced, adjustable arm. Various surgical accessories for coagulation and desiccation are also available. The shipping weight for the entire unit is about 175 pounds. Without subcabinet and accessories, the shipping weight is 98 pounds.

Liebel-Flarsheim SW-221 Short Wave Generator.

A tuned plate, tuned grid oscillating circuit is utilized, with the patient's circuit inductively coupled to the oscillator. There is a variable condenser in the patient circuit for resonating this circuit with the oscillator. A single tube is employed, operating at a wavelength of approximately 16 meters. The input power required to operate the unit at full load is 750 watts, according to the firm, and the output, using a lamp load, is 260 watts. The final temperature of the transformer after a run of two hours at a full load came within the limits of safety.

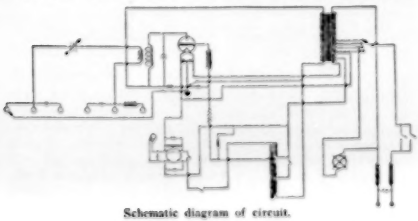
A filter is employed in the supply line for the purpose of minimizing line feed-back for possible radio interference. The circuit also incorporates a device which protects the oscillator tube from overload and gives an audible signal when the unit needs readjustment.

Tests were submitted by the firm to support claims made for the heating efficacy of the unit when applied to the human thigh.

Averages for Six Tests with Each of Three Technics

Technic	Deep Muscle, Degrees F.		Oral, Degrees F.	
	Initial	Final	Initial	Final
Coil	96.3	105.8	97.6	98.2
Cuff	97.3	104.6	97.9	98.1
Treatment drum	96.9	103.6	97.8	98.3

In addition, the firm submitted evidence to support the use of this unit in producing hyperpyrexia and for orificial heating. Seven fever therapy charts were supplied indicating temperature and pulse readings at fifteen minute intervals. These were run with the SW-221 Short Wave Unit and the Liebel-Flarsheim Fever Cabinet. Analysis of six charts shows that an average temperature of 106 F. or over was reached in an average induction period of approximately one and two thirds hours (unit on-off). From these data it would appear that the SW-221 Short Wave Unit may be used for raising general body temperature to 106 F. or over when used with the Liebel-Flarsheim Fever Cabinet for maintaining the temperature at the desired level.



Schematic diagram of circuit.

Seventeen tests were made with the SW-221 Short Wave Unit and the Chapman vaginal electrode. Twelve of these were carried out in an office of a qualified physician and five of them at a clinic. The twelve show an average initial temperature of 98.7 F. and an average final temperature of 108.6 F. Of the five tests, the initial average temperature was 97.8 F. and the average final reading was 108.4 F. These figures indicate that this unit may be efficacious for pelvic heating.

The unit was investigated in a clinic acceptable to the Council and it was reported to give satisfactory service.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Liebel-Flarsheim SW-221 Short Wave Generator for inclusion in its list of accepted devices.

WESTINGHOUSE THIN WINDOW LAMP ACCEPTABLE

Manufacturer: Westinghouse X-Ray Company, Inc., Long Island City, N. Y.

The Westinghouse Thin Window Lamp provides mercury arc radiation of an essentially monochromatic wavelength of 2,537 angstroms for limited use by the physician as a bactericidal and fungicidal agent. There is also thermal radiation from a hot cathode. The unit is compact, consisting of a Thin Window Lamp, shield and transformer, all of which are demountable from the stand for portable use. The arm holding the lamp housing on the stand is adjustable in various directions. Ultraviolet radiation is emitted only through a narrow treatment port in the hood, which also provides ventilation to the lamp. The hood and rim of the treatment port can be sterilized. Goggles and a velvet-lined carrying case are also provided.

Westinghouse Thin Window Lamp.

The high vacuum, hot cathode, mercury vapor glow lamp is encased in an envelop of high transmission glass with a very thin window (approximately $\frac{1}{1,000}$ inch). The high emission filament is flanked by two anodes. The transfomer and lamp require about 50 watts to function at 110 volts alternating current.

In order to operate the lamp, the rated voltage is applied to the filament for fifteen seconds for preheating purposes, after which the plate voltage is applied to each anode by a thermostatic relay. The arc is formed in mercury vapor present in the lamp and the radiations emanating are characteristic of a mercury arc discharge. The power supply is connected to the lamp through a specially designed transformer the inherent regulation of which automatically adjusts the current supplied to the lamp. A spectrum of the lamp radiation was submitted.

The radiometric investigation by the Council revealed ultraviolet 55 per cent, visible 10 per cent, infra-red 35 per cent.

1. *Spectral Radiation Intensities.*—The spectral ultraviolet intensities were determined radiometrically with a vacuum thermopile connected with an achromatic quartz-fluorite spectrometer and corrected for absorption. The spectral energy distribution differs remarkably from that of the low voltage, "hot quartz," mercury vapor lamp, having one or both electrodes of mercury, in which the intensity of the resonance emission line at 2,537 angstroms depends on the temperature and hence the amount (absorption) of mercury vapor in the burner. In the present model all the mercury is vaporized, there is no marked absorption by cool mercury vapor, and the intensity of the emission line at 2,537 angstroms, relative to the emission lines at longer wavelengths, is about three times that of this same line emitted by a so-called hot quartz lamp.

The intensity of the emission lines at 2,967, 3,024 and 3,132 angstroms respectively is somewhat higher than that of the high potential mercury vapor lamp.

Of the biologically effective radiation, including 3,132 angstroms and shorter wavelengths, over 80 per cent is in the emission line at 2,537 angstroms, recognized as having a strong germicidal action.

2. Total Radiation Measurements.—The intensity of the ultraviolet emitted by the lamp was determined by means of a differential thermopile and filter radiometer, recommended by the International Committee on Measurement and Standardization of Ultraviolet for Use in Medicine.

At a distance of 35 mm. from the front edge (portal protector) of the lamp housing, the intensity of the ultraviolet radiation, including 3,132 angstroms and shorter wavelengths, was found to be 650 microwatts per square centimeter. Of this amount, over 500 microwatts per square centimeter is in the highly germicidal emission line at 2,537 angstroms. Owing to absorption by the glass window and by the air, the intensities of the emission lines at 1,849 and 1,950 angstroms respectively are relatively weak radiometrically.

The erythematogenic efficiency of the emission line at 2,537 angstroms being only about 55 per cent that of the maximum at 2,967 angstroms, it is possible to deliver about twice as much radiation without causing an erythema. Moreover, in comparison with the skin tolerance to wavelengths at 3,134 angstroms, the biologic effects are distinctive in that a large overexposure is permissible without causing a blister.

Under radiometrically controlled conditions a threshold erythema (minimum perceptible erythema) was produced on the untanned skin by an exposure of sixty seconds at a distance of 35 mm. in front of the portal protector of the lamp, in good agreement with the calculated time of exposure of seventy seconds.

As evidence to establish the bactericidal and dermatologic effects of the lamp, the firm furnished reports of clinical and experimental studies from various physicians. A study of the in vitro bactericidal effects of the lamp was also furnished.

Five qualified physicians investigated the lamp for the Council. Clinical tests on normal skin revealed that even prolonged exposures (fifteen minutes) with the Thin Window Lamp failed to produce vesiculation. Persistent erythema, followed by exfoliation, was noted in all cases in which the prolonged exposures were given. Of the many dermatologic conditions that were treated with varying doses, none showed any irritation.

The lamp was used successfully for the treatment of furuncles, carbuncles, chronic granulating surfaces and various localized skin diseases. It is not to be assumed, however, that the lamp may be substituted for x-rays, other forms of ultraviolet generators or conventional topical remedies for the treatment of many dermatologic conditions.

The lamp was recommended after these studies for the reasons that:

1. It emits ultraviolet radiations and is a generator of essentially monochromatic ultraviolet radiation of a wavelength which produces persistent erythema without blistering, combined with infra-red radiation.

2. It is bactericidal in vitro.

3. It is particularly suitable for treating small lesions and diseases of the skin of limited localization. The claim that the Thin Window Lamp is a useful aid in controlling pyogenic, fungous and parasitic skin infections, indolent ulcers and wounds cannot be wholly substantiated according to some clinical experience. There is no doubt that in vitro, pyogenic and fungous organisms may be attenuated or destroyed, but in vivo the beneficial effects of ultraviolet radiation emitted by the Thin Window Lamp on disease caused by these organisms are not so striking.

4. It is easy and convenient to use.

5. It is portable.

6. It has a good margin of safety in its application. In view of the foregoing report, the referee recommends that the Council on Physical Therapy accept the Westinghouse Thin Window Lamp for inclusion in its list of acceptable devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

SULFANILAMIDE (See New and Nonofficial Remedies, 1939, p. 463).

Sulfanilamide-Merrell.—A brand of sulfanilamide-N. N. R.

Manufactured by the Wm. S. Merrell Company. No U. S. patent or trademark.

Sulfanilamide Tablets, 5 grains.
Sulfanilamide Tablets, 7½ grains.

SULFANILAMIDE-ABBOTT (See New and Nonofficial Remedies, 1939, p. 466).

The following dosage form has been accepted:

Sulfanilamide-Abbott, 4 Gm. Ampoules (Crystals).

IMMUNE GLOBULIN (HUMAN) (See New and Nonofficial Remedies, 1939, p. 412).

Sharp & Dohme, Inc., Philadelphia and Baltimore.

Immune Globulin (Human).—A sterile concentrated globulin obtained from human placental blood and tissue and containing immune factor or factors against measles. The placentas are repeatedly incised and extracted with 4 per cent saline solution for forty-eight hours. The soluble material is centrifuged, precipitated with ammonium sulfate, filtered, and otherwise refined and concentrated by standard methods used in the concentration of antitoxins. The final product is adjusted to a *p*H of 7.0 and contains 0.5 per cent of phenol. Sterility is obtained by filtration. Its immunizing potency is determined on the basis of the diphtheria antitoxin titer of the placental blood. Marketed in packages of 2 cc. and 10 cc. ampule-vials.

STEARNS VIOSTEROL (A. R. P. I. PROCESS) IN OIL.—A brand of viosterol in oil-N. N. R.

Manufactured by the American Research Products, Inc., a subsidiary of General Mills, Inc., Minneapolis, under license agreement with E. I. du Pont de Nemours Company (Frederick Stearns & Company, distributor). U. S. patent 2,117,100 (May 10, 1938; expires 1955).

Stearns viosterol (A. R. P. I. Process) in oil is prepared by the activation of ergosterol by low velocity electrons. The activated ergosterol is refined and dissolved in vegetable oil. The final product is biologically assayed to contain not less than 10,000 units (U. S. P.) of vitamin D per gram.

STEARNS COD LIVER OIL CONCENTRATE IN VEGETABLE OIL.—A concentrate of the nonsaponifiable fraction of cod liver oil dissolved in corn oil, adjusted to a potency of not less than 58,800 units (U. S. P.) of vitamin A per gram and not less than 5,800 units (U. S. P.) of vitamin D per gram.

Actions and Uses.—It possesses the therapeutic properties recognized for the vitamins present in cod liver oil.

Dosage.—For the liquid: Daily prophylactic dose for the average infant and child, from 6 to 9 drops. For the capsules: One capsule daily.

Manufactured by the International Vitamin Corporation, New York (Frederick Stearns & Company, Detroit, distributor). The concentrate used is made under U. S. patent 1,690,091 (Oct. 30, 1928; expires 1945).

Stearns Cod Liver Oil Concentrate Capsules, 3 minims.—Each capsule contains 3 minims of Stearns cod liver oil concentrate in vegetable oil adjusted to a potency of not less than 10,000 units (U. S. P.) of vitamin A and 1,000 units (U. S. P.) of vitamin D per capsule.

STEARNS COD LIVER OIL VITAMIN CONCENTRATE TABLETS.—A concentrate of the nonsaponifiable fraction of cod liver oil in the form of tablets, each having a potency of not less than 3,150 units (U. S. P.) of vitamin A and 315 units (U. S. P.) of vitamin D.

Actions and Uses.—Stearns cod liver oil vitamin concentrate tablets possess properties similar to those of cod liver oil so far as these depend on the vitamin content of the latter.

Dosage.—Two to three tablets daily, or as prescribed by physician.

Manufactured by the International Vitamin Corporation, New York (Frederick Stearns & Company, Detroit, distributor). The concentrate used is made under U. S. patent 1,690,091 (Oct. 30, 1928; expires 1945).

STEARNS HALIBUT LIVER OIL PLAIN.—A brand of halibut liver oil-N. N. R.

Prepared by the International Vitamin Corporation, New York (Frederick Stearns & Company, Detroit, distributor). No U. S. patent or trademark.

Stearns Halibut Liver Oil Plain, Capsules, 3 minims.—The content of each capsule is assayed to contain not less than 10,000 units (U. S. P.) of vitamin A and not less than 170 units (U. S. P.) of vitamin D.

Stearns halibut liver oil plain is prepared by extracting the oil of fresh halibut livers. The oils are refined and assayed biologically to have not less than 59,000 units (U. S. P.) of vitamin A and 1,000 units (U. S. P.) of vitamin D per gram.

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SATURDAY, SEPTEMBER 23, 1939

EPIDEMICS AFTER WARS

In practically every war for which accurate records are available, disease has always caused more deaths than military maneuvers and engagements. Typhus, plague, cholera, typhoid, dysentery, pneumonia and influenza do more damage under military conditions than can be brought about by dynamite, torpedoes, gun powder and poison gas. As Dr. Hans Zinsser has said, "Epidemics get the blame for defeat; generals the credit for victory. It ought to be the other way around."

In many a great war of the past, epidemic has come to terminate the conflict. According to Lieut. Col. Nelson Mercer,[1] the Persians under Xerxes were defeated in their invasion of Greece by plague and dysentery. In 1741 the French captured Prague because of a typhus epidemic among the Austrian defenders. Napoleon's campaign failed in Russia because of typhoid, typhus and pneumonia. In the Mexican War of 1846-1847, 100,000 soldiers went to Mexico; of these 10,986 died of typhoid, dysentery, smallpox, malaria and tropical diseases—only 1,549 were killed or died of wounds. In the Civil War the Union Army lost more than 200,000 men by disease and approximately 112,000 from battle wounds.

The records of the Spanish-American War and of the World War are so recent that they linger in the memories of many of us. In the Spanish-American War deaths of American troops in battle were 379, but 4,795 died from disease, most of them never reaching Cuba. In the camps in this country typhoid caused 20,904 cases and 2,188 deaths. During the World War, Mercer points out, our losses were 58,119 from disease, 50,385 killed or died of battle wounds. A large percentage of deaths were, of course, the result of the pandemic of influenza which prevailed in 1918. By this time typhoid had been brought under control so that there were only 2,200 cases of typhoid among more than 4,000,000 soldiers, and there were only 200 deaths.

When influenza swept the world in 1918, epidemiologists undertook investigations and surveys with a view to developing knowledge which might prevent a similar occurrence in the future. At that time it became evident that there is a periodicity in these attacks and that it might reasonably be suspected that a similar epidemic would return twenty-five or thirty years later. Recently Dr. Thomas M. Rivers of the Rockefeller Institute told the Congress on Microbiology in New York that another outbreak of influenza may well be expected in association with the present war. He pointed out at the same time that we have not as yet any effective weapon for either the prevention or the treatment of influenza.

In the World War of 1918 the problems of tetanus and of gas gangrene were serious. Much was learned relative to the proper treatment of war wounds. Since that time there has been great advance in the development of antiseptics and of the surgery of trauma. New drugs like sulfanilamide and sulfapyridine give possibility of control over various types of infection which formerly were invariably fatal. Pneumonia of certain forms has begun to yield to specific antiserums and to sulfapyridine. Gas gangrene, too, seems to be more amenable to modern chemotherapy, whereas it was apparently resistant to all efforts in 1918. In the last world war, trench fever and trench mouth accounted for vast numbers of cases of disability. We have learned much, too, about the control of these conditions.

Yet the fact remains that the assembling of great masses of men under conditions in which sanitation is difficult, if not impossible, and the movement of great numbers of men across wide areas of country where they come in contact with new populations invariably mean the spread of disease. The louse that spreads typhus fever, the rats concerned with plague, and many another insect and animal carrier of disease still exist, ready to demonstrate, when the favorable opportunity comes, that man is but a morsel in the great cosmic scheme and that when he seeks to destroy himself nature stands cynically ready to assist him.

1. Mercer, Nelson: Disease in Military Campaigns, Mil. Surgeon **78**: 130 (Feb.) 1936.

GROUP HEALTH ASSOCIATION CONTRACT UNIQUE BUT NOT INSURANCE, SAYS U. S. COURT

In the opinion of the United States Court of Appeals for the District of Columbia,[1] the contract between Group Health Association, Inc., and its members may be unique, the obligation assumed by the corporation to its membership may be tenuous and the members' responsibility to it may be correlatively attenuated, but the contract is not one of insurance or indemnity. The court, in a decision rendered September 11, thus upheld the judgment of the District Court of the United States for the District of Columbia, that Group Health Association does not have to comply with the insurance laws of the District of Columbia. Whether or not the contract is a fair one, or whether or not it lacks sufficient

1. Albert F. Jordan, Superintendent of Insurance for the District of Columbia, appellant, v. Group Health Association, a corporation, appellee, decided Sept. 11, 1939.

consideration or mutuality of obligation to be valid and enforceable, the court refrained from discussing; those issues were not before it. A contract of insurance, the court pointed out, is predicated on the existence of a risk of loss to which one party may be subjected by contingent or future events and an assumption of that risk by another, by legally binding arrangement. Hazard is essential, and equally so a shifting of the resulting liability from the person primarily exposed to risk to some one else. If there is no risk, or there being one it is not shifted to another or others, there can be, in the judgment of the court, neither insurance nor indemnity. After reviewing the by-laws of the corporation, not as they were originally adopted in 1937 but as they have been variously amended since that time, the court was convinced that neither of these two elements was present in the contract entered into between the corporation and its members. The effect of the Group Health Association arrangement, according to the by-laws as interpreted by the court, is to make available to members, if they wish to receive them, the services of the physicians employed by the corporation. The only obligation the corporation assumes toward its members is to make contracts with physicians and others. There is no agreement or binding obligation to provide such service or see that it is supplied. It does not guarantee that any of the services will be rendered nor does it assume any liability for any act of omission or commission by any physician who does render them. If for any reason it becomes unable to procure any or all such services when called on to do so, its only obligation is "to use its best efforts to procure the needed services from another source." After carefully reviewing the by-laws of the corporation, the court referred to the obligation assumed by the corporation as tenuous and to the contract as unique. The court called attention to the uncertainty of the member's right of recourse against the corporation for a breach of its contract with him to emphasize the nonexistence of an assumption of risk by the corporation or an agreement of indemnity.

Even though Group Health Association, Inc., were otherwise within the purview of the insurance laws, the court thought that the corporation was a "relief association not conducted for profit composed . . . solely of employees of any other branch of the United States government service," within the meaning of the insurance laws of the District of Columbia and thus excused from complying with such laws. The court did not refer, however, to any provision in the by-laws of the corporation that limits the services of physicians employed by it to members who in fact need financial aid. So far as is known there is no such limitation, the member who is a charwoman and the member who is a highly paid executive being entitled to the same quality and quantity of services. Although the insurance laws provide that a relief organization must be composed solely of employees of the government to be entitled to exemption, the court thought that the fact that dependents of employees are entitled to membership in the corporation does not disturb its exempt status. The court based its construction of the law in this respect only on what it referred to as "the almost universal practice of relief associations and departments" and not on any statute or court decision.

The gist of the decision seems to be that the contract between Group Health Association, Inc., and its members imposes no legally enforceable obligation on the corporation to furnish relief or service of any kind under any condition and that, since the corporation assumes no risk to which a member may be subject, the contract is not one of insurance and the corporation is not engaged in the business of insurance.

HEALTH INSURANCE IN AUSTRALIA AND NEW ZEALAND

At a time when there seems to be much controversy as to the exact status of health insurance and legislation for state medicine in Australia and New Zealand, the official report of the Committee on Economics of the Canadian Medical Association,[1] presented at the annual meeting in Montreal, June 19 to 23, is especially welcome. The similarity of reactions of the medical profession throughout the world indicates how much physicians are concerned everywhere in maintaining suitable standards of medical practice.

In 1924 the commonwealth government of Australia appointed a royal commission on national health insurance. This commission omitted medical benefits from its system of insurance and recommended only old age pension and sickness benefit. Action did not follow this report. Then in 1935 the commonwealth government invited Sir Walter Kinnear, controller of the insurance department, Ministry of Health, England, to visit Australia and to assist in the investigation of a national health insurance scheme. Sir Walter did not consult with the medical profession while on this visit, but when he was again called in 1938, representatives of the profession did meet with him and discuss the problem. A bill, however, was prepared without consideration of the position of the medical profession. The main objections of the physicians to this bill were (1) the control of medical benefits by lay persons, (2) the power of the insurance commission with regard to regulations (i. e. bureaucratic control) and (3) the inadequate payment. Despite the protests of the profession, the bill was forced through both houses in April 1938.

Objections from the people of Australia supplemented those of the medical profession as the provisions of the bill became known. It was discovered that the unemployed and the unemployable and their dependents were not insured and that, while there was a wage limit of £365 per annum, there was no total income limit. For these and other reasons the medical profession opposed

1. Canad. M. A. J. 41:147 (Sept.) 1939.

the act and substituted a proposal of its own which provided for a definite income limit, representation of the medical profession in the administration, free choice of doctor and a definite scale of fees.

Early in 1939 the federal government decided to abandon completely its national insurance scheme. This was partly because of the "fear that the financial burden involved might stifle normal developmental expenditure if it fell simultaneously with the heavy defense program and while the greater part of the commonwealth is suffering from the effects of severe drought and widespread bush-fires; and secondly, because the act is highly unpopular throughout Australia, and its introduction against the wishes of the people might lead to grave political consequences."

New Zealand already had an extensive public health service, giving the department of health wide powers. Then in 1938 the Social Security Act was passed to become operative April 1, 1939. This act, along with benefits for superannuation, invalids, widows, orphans, families with more than two children, minors and the unemployed, and cash benefits during sickness, provided for general practitioner service to all residents of New Zealand regardless of income. This also included the supply of all necessary drugs and medicines, appliances, free treatment in public hospitals, partial payment of private hospital charges, clinical and other outpatient services, free treatment in state mental hospitals and in public maternity hospitals, the services of doctors, nurses and all other necessary services in maternity cases, and also home nursing and domestic assistance, services of specialists and consultants, radiologic and laboratory services, and dental and ambulance services.

This law was preceded by an investigation by a committee of seven members of the house of representatives with a socialist doctor as the chairman. When the bill was introduced in accordance with these recommendations, the medical profession with a unanimity of 95 per cent resolved to oppose the measure. The bill, nevertheless, was rushed through parliament with a vote of fifty-six out of eighty seats.

About a month after the bill was passed, a general election was held at which the government increased its majority. This vote was accepted as a popular endorsement of the social security act. As opposition grew the government made overtures to reopen discussion, proposing to introduce a system of remuneration on a basis of payment for service rendered. There does not appear, however, to be much possibility of closer accord between the government and the medical profession. There does not seem to be any great popular demand for health insurance. The physicians of New Zealand hold that on account of existing facilities there is less need for a system of health insurance in New Zealand than anywhere else in the world. The medical profession has indicated its willingness to cooperate with the government on all matters affecting the health of the community, but little advantage has been taken of this offer. The act provides for a levy on all earnings of the community in the form of a social security tax of 1 shilling in the pound. The medical profession addressed a letter to the committee of the House of Representatives on National Superannuation and Health Insurance, which said among other things:

> All are agreed that the promotion of health is a greater object than the treatment of sickness in that prevention is better than cure. We do not underestimate the importance of curative medicine, but national health insurance, which is really a system of indemnification for sickness, does not (especially in the proposals put forward by the government) materially advance the greater object of the promotion of health. There are certain conditions in relation to environment, to conditions at work, to domestic help, to nutrition of the young, to preventive medicine and to research which we as a profession know to be unsatisfactory. . . . Continuous and studied attention to those conditions will do far more for the people than the introduction of any costly system of health insurance, and the provision of a universal general practitioner service would do nothing toward remedying these deficiencies.

Current Comment

THE STUDENT SECTION

In this issue on page 1267 the Student Section of THE JOURNAL begins its second year. The leading article on factors influencing ethical concepts and ideals among medical students is contributed by two students of Emory University School of Medicine, Atlanta, both officers in the American Association of Medical Students. This paper is followed by an address by the president of the Royal College of Surgeons of England before a graduating class of medical students; also a discussion of the question "Should Students Marry?" and a summary of the accomplishment of freshmen in eighty-five medical colleges in the United States and Canada. These articles and the news items on succeeding pages should help medical students adjust themselves to their work. The Student Section is devoted to the educational interests and welfare of medical students, interns and residents in hospitals. Any one interested may submit papers, correspondence or news items, which will be given careful consideration.

MICHAEL M. DAVIS AND THE COMMITTEE OF PHYSICIANS

In the current issue of *Survey*—the midmonthly for September 1939—appears an article entitled "Senators, Doctors and National Health," by Michael M. Davis, chairman of the Committee on Research in Medical Economics, Inc. The Committee on Research in Medical Economics, Inc., readers will remember, is conducted with a matter of $135,000 donated by the Rosenwald Foundation as its final contribution in the medical economics field. Mr. Michael M. Davis is, for five years, to undertake studies in the field of medical economics, where his interests and his invitations lead him. His article, which occupies one page of the *Survey*, is apparently a review of the preliminary report of the subcommittee of the Senate Committee on Education and Labor. Mr. Davis presumably speaks strongly for the so-called Committee of Physicians and bitterly if

not sneeringly about the American Medical Association. He urges popular groups to realize that the physicians of this committee will work with them toward a common goal. The Committee of Physicians has not made public for some time any information concerning its official personnel, its financial status, the methods by which its conclusions are reached or the extent to which the original signers, that is the 430, or the subsequent signers, participate either in drawing up or approving its conclusions. Such information would undoubtedly be of value to the medical profession in its evaluation of the significance of the actions taken and the propaganda circulated by this body. By most physicians the testimonial of Mr. Michael M. Davis will not be considered an endorsement.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Study of Trachomatous Navajo Children.—From June 1 to July 17 medical officials of the Indian Medical Service made a study of trachoma in 122 children from the Navajo Indian Reservation. The children were brought from day schools on the reservation to the boarding school at Fort Defiance and received courses of sulfanilamide treatment covering a period of twenty-two days. The laboratory work was done at the Navajo General Hospital, Fort Defiance.

ARKANSAS

Changes in Health Officers.—Dr. Leroy L. Fatherree has been appointed full time health officer of Little Rock to succeed the late Dr. Thomas M. Fly.——Dr. John T. Herron, Little Rock, has been assigned as health director of the district composed of Ashley, Desha and Chicot counties.

State Medical Board Elects.—Dr. Lorenzo T. Evans, Batesville, has been elected president of the State Medical Board of the Arkansas Medical Society; Dr. De Veaux L. Owens, Harrison, vice president, and Dr. Daphney E. White, El Dorado, secretary.

Trachoma Investigation.—The state board of health in cooperation with the state department of public welfare began a study of trachoma in Arkansas with a diagnostic clinic in Jonesboro August 24. This was said to be the first clinic of its kind in the state and was extended to the population of the northeastern part of the state, where trachoma appears to be prevalent. Drs. Arthur M. Washburn, director of the division of communicable disease of the state board of health, and Kingsley W. Cosgrove, state supervising ophthalmologist for the welfare department, were in charge of the clinic. They were assisted by Drs. William B. Harrell Jr., Jonesboro, county health officer, Martin E. Blanton and Oscar T. Cohen, Jonesboro, district ophthalmologists for the welfare department. A study of trachoma in relation to blindness by this group during the past year shows that about 90 per cent of the blind examined have suffered from trachoma.

CALIFORNIA

Epilepsy a Reportable Disease.—Epilepsy is now a reportable disease in California, according to the state department of health. The new law went into effect September 19. In the future it will be the duty of every practicing physician to report every patient with epilepsy to the local health officer, who will send the report to the state department of public health. This information will then be made available to the motor vehicle department. Failure to report will constitute a misdemeanor.

COLORADO

State Medical Meeting in Colorado Springs.—The sixty-ninth annual session of the Colorado State Medical Society will be held at the Antlers Hotel, Colorado Springs, October 5-7, under the presidency of Dr. Leo W. Bortree, Colorado Springs. The guest speakers will include:

Dr. Knox E. Miller, Washington, D. C., Role of the Medical Profession in the Control of False and Misleading Advertising.
Miss Joy Erwin, Denver, The Doctor and the Nurse at Work.
Dr. Rock Sleyster, Wauwatosa, Wis., President, American Medical Association, Medical Problems of the Day.
Dr. Neely C. Washburn, Randolph Field, Texas, Physical, Physiologic and Psychologic Considerations in Selecting Personnel for Military Aviation.
William S. McNary, Denver, The Doctor's Stake in Group Hospitalization.
Dr. Irving S. Cutter, Chicago, The Significance of Minor Signs of Indigestion.
Dr. Harry R. Foerster, Milwaukee, Occupational Dermatoses.
Donald E. Cummings, Saranac Lake, N. Y., Tuberculosis in Industry.
Dr. Royd R. Sayers, Washington, D. C., Industrial Hygiene.

Advertising claims versus medical facts will be discussed in a symposium from the University of Colorado School of Medicine, Denver, covering blood tonics, cathartics, sedatives, cosmetics and tobacco; the speakers will be Drs. William A. Rettberg, Ora L. Huddleston, Charles A. Rymer, Gerald M. Frumess and Robert T. Terry. Dr. Miller's paper will be an adjunct to the symposium. Other speakers on the program will include:

Mr. Harvey T. Sethman, Denver, The Last Ten Years and the Outlook.
Dr. Herman I. Laff, Denver, Value of Bronchoscopy in Pulmonary Tuberculosis.
Dr. Donn J. Barber, Greeley, A Comparative Study of the Tuberculin Patch Test.
Dr. John S. Bouslog, Denver, Roentgen Therapy in Inflammatory Disease.
Dr. Frederick R. Harper, Denver, Management of Disappointing Results of Gastroenterostomy.
Dr. Herbert A. Black, Pueblo, Differential Diagnosis of Biliary Tract Disease.
Drs. Duval Prey and John M. Foster Jr., Denver, Traumatic Appendicitis.
Dr. Harry H. Lamberson, Colorado Springs, Gonococcal Infections in the Male Associated with Hypospadias.
Dr. Robert W. Dickson, Denver, Sterility in the Male.
Dr. Jack G. Hutton, Denver, Nonvenereal Syphilitic Infections.
Dr. John B. Hartwell, Colorado Springs, Diagnosis and Treatment of Vaginal Discharge.
Dr. Clifford Lee Wilmoth, Denver, Surgical Conditions of the Knee Joint.
Dr. Robert G. Packard, Denver, Trimalleolar Fractures of the Ankle with Backward Displacement of the Foot.
Dr. Lorenz W. Frank, Denver, Vocational Diseases from the Standpoint of the Internist.
Dr. Everett E. Monro, Grand Junction, Silicosis.

At the annual banquet Saturday evening Dr. Cutter will discuss "Edwin James—Pioneer Physician, Botanist and Explorer."

DISTRICT OF COLUMBIA

Chiropractor Convicted.—The District of Columbia Commission on Licensure recently reported that I. Moton Johnson, a chiropractor, was convicted of practicing medicine without a license and sentenced to sixty days in jail July 27.

Personal.—Dr. J. Winthrop Peabody resigned August 1 as superintendent and medical director of the Glenn Dale Sanatorium to devote his time to private practice. Dr. Daniel Leo Finucane, assistant superintendent, has been appointed superintendent.

The William A. White Memorial Lectures.—The superintendent and staff of St. Elizabeths Hospital and the board of trustees of the William Alanson White Psychiatric Foundation announce the first series of William Alanson White Memorial Lectures. Dr. Harry Stack Sullivan, New York, will deliver the lectures Friday evenings in the auditorium of the building of the Department of the Interior on "Modern Psychiatric Conceptions." The subjects and dates are:

October 27, Conceptions of Modern Psychiatry.
November 3, Organism and Environment.
November 10, Diagnostic and Prognostic Syndromes.
November 17, Explanatory and Therapeutic Conceptions.
November 24, Prospective Developments and Research.

Health Officer Urges Increase in Health Budget.—Health Officer George C. Ruhland recently submitted a 1941 budget of $3,591,340, an increase of 43 per cent over the present appropriation, according to the Washington *Post*. The increase would carry out a recommendation of the U. S. Public Health Service for a $250,000 health center for northwest central Washington, which has the highest general mortality rate in the city, and $200,000 for a children's ward at Gallinger Hospital and better housing of interns and families of resident physicians. A fund of $1,310,700, an increase of $411,300 over

the present appropriation, would be used for maintenance of Gallinger Hospital, including buildings now being constructed with PWA funds. The new budget would also provide for the addition of 357 health service employees.

FLORIDA

Court Upholds Exclusion of Osteopaths from Municipal Hospital.—A municipality, according to the circuit court, eleventh judicial circuit, Florida, in the recent case of *Richardson, an ostcopath*, v. *Miami*, may through its proper officers and agents regulate the use of the facilities of a hospital it operates and unless a practitioner can qualify under the regulations that have been adopted he may not complain to the courts over being denied admittance. No member of any school of medicine, the court pointed out, has as such a right to the privileges of a municipal hospital, and even though the Florida osteopathic practice act undertakes to accord to osteopaths "the same rights as physicians and surgeons of other schools of medicine with respect to the treatment of cases or holding of offices in public institutions" that act regulates the practice of osteopaths, not the operation of hospitals.

ILLINOIS

Nineteen Deaths from Typhoid.—Nineteen deaths have been reported in an outbreak of typhoid at the Manteno State Hospital, according to the newspapers September 16. The outbreak has been attributed to a polluted water supply at the hospital (THE JOURNAL, September 9, p. 1041, and September 16, p. 1138).

Supervisor of Registration Resigns to Make Hair Tonic.—Homer J. Byrd, supervisor of registration of Illinois, has resigned to "devote himself to the manufacture and sale of hair tonic and shampoo," according to the Chicago *Tribune*. He is also in the printing ink business, it was stated. Governor Horner has accepted the resignation and the position will be filled by Lucien A. File, Chester, until an appointment is made.

Chicago

Grant for Child Research.—Applications will be received up to September 30 for the Elizabeth McCormick Child Research Grant of the Institute of Medicine of Chicago. This grant makes available $750 for some form of encouragement toward child welfare and will be awarded to a qualified investigator in the Chicago area to aid in a piece of research. Projects should in a broad sense be in the field of pediatrics. Additional information may be obtained from Dr. John Favill, secretary of the committee on the Elizabeth McCormick Child Research Grant, 122 South Michigan Avenue.

Public Meetings of the Chicago Medical Society.—The Chicago Medical Society is planning a series of public meetings at the Chicago Woman's Club Theater on Eleventh Street near Michigan Avenue at 8:30 p. m. on the first Wednesday of each month from October through April. Topics of popular interest and importance will be presented by members and guests of the society. Seats on the main floor of the theater will be reserved until 8:25 p. m. for holders of tickets. Those remaining vacant on the floor at that hour and the seats in the balcony will be open to the general public. Tickets may be obtained free on application to the office of the Chicago Medical Society, 30 North Michigan Avenue, or through one's doctor. Tickets to individual meetings or to the whole series may be requested. The program for this series of meetings follows. When only the topic is announced it is because the speaker has not been definitely selected.

October 4, Are You and Your Children Being Exposed to Tuberculosis? Where to Find Tuberculosis, Dr. Winston H. Tucker, health commissioner of Evanston.
How to Find Tuberculosis, Dr. Robert G. Bloch, Department of Medicine, Division of Biological Sciences, University of Chicago.
How to Treat Tuberculosis, Dr. James A. Britton, Northwestern University Medical School.
November 1, Famous Madcaps of History, Dr. Winfred Overholser, St. Elizabeths Hospital, Washington, D. C.
December 6, The National Health Program and Public Health.
Jan. 3, 1940, When Smallpox Comes, Dr. Victor G. Heiser, New York.
February 7, A joint meeting with the Chicago Heart Association.
March 6, A joint meeting with the cancer committee of the Chicago Woman's Club.
April 3, Infectious and Contagious Diseases and Their Relation to Chronic Disease, Drs. Archibald L. Hoyne and George H. Coleman.

In addition to this series the society is sponsoring public meetings on the economic aspects of medicine to be held in its branches under the auspices of the society, the branch and in some instances of some local organization. A debate is being arranged which will be held at the Nichols School Auditorium in Evanston under the auspices of the society, its Evanston branch, and the Lincoln School Association of Parents and Teachers November 7. A joint public meeting with the South Chicago branch is to be held on October 29. The dates and locations of such meetings and the topics and speakers will be announced as soon as definite arrangements are made. Some of these meetings in the branches will be in the form of debates, others round table discussions and others addresses followed by open forums.

INDIANA

State Medical Meeting in Fort Wayne.—The Indiana State Medical Association will hold its annual meeting at the Shrine Theater, Fort Wayne, October 10-12, under the presidency of Dr. Edmund M. Van Buskirk, Fort Wayne. Out of state speakers will include:

Dr. Joseph Felsen, New York, The Newer Concepts of Intestinal Infection.
Dr. Byrl R. Kirklin, Rochester, Minn., Some Contributions of the Roentgen Ray to Advances in Diagnosis.
Dr. Frederick W. Clement, Toledo, Ohio, Postoperative Pulmonary Complications.
Dr. Evan G. Galbraith, Toledo, Ohio, Cause, Prevention and Treatment of Pulmonary Atelectasis.
Dr. Emmet F. Horine, Louisville, Ky., Psychologic Factors in Heart Disease.
Dr. Raphael Isaacs, Ann Arbor, Mich., Diagnosis and Treatment of Pernicious Anemia.
Dr. Willis C. Campbell, Memphis, Tenn., Surgery of the Hip Joint.
Joseph E. Schaefer, M.D., D.D.S., Chicago, Oral and Plastic Surgery.
Dr. Paul Dudley White, Boston, Diagnosis and Treatment of Cardiovascular Emergencies.
Dr. Edmund L. Keeney, Baltimore, The Medical and Surgical Treatment of Severe Bronchial Asthma.
Dr. Henry B. Orton, Newark, N. J., Bronchoscopy as an Aid to Treatment.

Among the Indiana speakers will be:

Drs. Ezra V. Hahn and Paul Merrell, Indianapolis, Diagnosis and Treatment of Peripheral Vascular Diseases.
Drs. Irvine H. Page and Kenneth G. Kohlstaedt, Indianapolis, The Sulfapyridine Treatment of Pneumonia.
Dr. Robert V. Hoffman, South Bend, The Serum Treatment of Pneumonia.
Dr. Frank H. Green Jr., Rushville, The Diagnosis and Medical Management of Ectopic Pregnancy.
Dr. Paul S. Johnson, Richmond, Fatigue, Its Causes and Treatment.
Dr. Robert G. Moore, Vincennes, The Heart Neuroses, Their Diagnosis and Treatment.
Dr. Roscoe L. Sensenich, South Bend, Diagnosis and Treatment of Peptic Ulcer.
Dr. Clair L. Ingalls, Washington, Specific Primary Peritonitis.
Dr. Frank L. Jennings, Oaklandon, Collapse Therapy of Pulmonary Tuberculosis.
Dr. Maurice S. Schulhof, Muncie, Renal Anomalies from a Surgical Standpoint.
Dr. Fred A. Thomas, Indianapolis, Complications Following General Anesthesia.
Dr. Everett T. Zaring, Terre Haute, Who Should Choose the Anesthetic?

At the annual banquet Wednesday evening the speakers will be Dr. Nathan B. Van Etten, New York, President-Elect, American Medical Association, and George Lang, Ph.D., professor of philosophy, University of Alabama, University, "Twentieth Century Medicine Man." At the meeting of the woman's auxiliary, the speakers will include Dr. Edgar F. Kiser, Indianapolis, on "A Brief Sketch of the History of Medicine," and Louis A. Warren, director of the Lincoln Museum, "The Woman Who Influenced Lincoln Most." Entertainment will include various fraternity luncheons and a skeet and trap shoot.

KANSAS

Society News.—At a meeting of the Sedgwick County Medical Society September 19 the speakers were Drs. Harold F. O'Donnell, Wichita, on "Sulfapyridine in the Treatment of Gonorrhea" and Robert H. Maxwell, Wichita, "Ten Year Study of Cesarean Section in Sedgwick County."

New Tuberculosis Unit.—The new $425,400 Kinney Memorial Hospital was dedicated at the Kansas State Sanatorium for Tuberculosis, Norton, August 23. With 253 beds furnished by the new unit, the sanatorium now has a total of 563 beds. The speakers at the exercises included Governor Payne Ratner and Dr. Howard L. Snyder, Winfield.

NEBRASKA

Annual Clinical Meeting in Omaha.—The seventh annual assembly of the Omaha Mid-West Clinical Society will be held October 23-27. Among speakers listed in a preliminary announcement are: Drs. Charles Anderson Aldrich, Winnetka, Ill., pediatrics; William Wayne Babcock, Philadelphia, and Elliott C. Cutler, Boston, surgery; Clifford J. Barborka, Chicago, William R. Houston, Austin, Texas, and Samuel A. Levine, Boston, medicine; Frank E. Burch, St. Paul, eye, ear, nose and throat; Louis J. Karnosh, Cleveland, neurology; Clarence R. O'Crowley, Newark, N. J., genito-urinary disorders; Grandison D. Royston, St. Louis, gynecology and obstetrics; Walter Schiller, Chicago, basic sciences, and James S. Speed, Memphis,

Tenn., orthopedic surgery. There will also be a symposium on preoperative and postoperative treatment presented by Drs. William L. Estes Jr., Bethlehem, Pa.; John S. Lundy, Rochester, Minn.; Walter G. Maddock, Ann Arbor, Mich., and John R. Paine, Minneapolis.

NEW JERSEY

Camden Schools Closed Indefinitely.—The New York *Times* reported September 16 that public and parochial schools in Camden would be closed indefinitely because of infantile paralysis. Ninety-one cases have occurred in the county since July 1 with ten deaths. Schools in Camden and several suburbs had delayed opening until September 18 because of the prevalence of the disease.

NEW YORK

Course in Organic Neurology.—Dr. Wardner D. Ayer, Syracuse, will give a course on organic neurology for the Schoharie County Medical Society, Cobleskill, and the Montgomery County Medical Society at Amsterdam on six Tuesdays beginning September 26. The course is given under the auspices of the committee on public health and education of the Medical Society of the State of New York, of which Dr. Thomas P. Farmer, Syracuse, is chairman. Subjects of Dr. Ayer's lectures will be:

September 26. The Brain and Spinal Cord.
October 3. (a) The Neurologic Examination and (b) The Lumbar Puncture and Examination of Spinal Fluid.
October 10. Acute Infectious Processes.
October 17. Cerebral Hemorrhage and Thrombosis, Cerebral Trauma, Cerebrospinal Syphilis and Parkinson's Disease.
October 24. The Brain Tumor, Brain Abscess and Epilepsy.
October 31. Spastic Paraplegia and Diseases of the Spinal Cord, Peripheral Neuritis and Pathology of the Intervertebral Disk.

New York City

Personal.—Henry S. Pritchett, Ph.D., president emeritus of the Carnegie Foundation for the Advancement of Teaching, died August 28 in Santa Barbara, Calif., aged 82 years.—— Dr. Charles F. McCarty, Brooklyn, recently medical director of the city department of welfare, has been appointed associate director of medical activities of the Medical Society of the County of Kings.

Short Courses for Practitioners.—The New York Post-Graduate Medical School announces short courses varying from five days to a month or more, full time, in arthritis and rheumatic diseases, October 2-6; internal medicine, October 2 to November 30; neurology, the month of October; orthopedics, October 9-14. In addition, the graduate school offers part time courses for local physicians in bacteriology, dermatology and syphilology, gynecology, medicine, neurology and psychiatry, ophthalmology, orthopedics, otolaryngology, pathology and pediatrics. Address inquiries to the Director, 309 East Twentieth Street, New York.

Dr. Rhoads to Succeed Dr. Ewing at Memorial Hospital.—The board of managers of Memorial Hospital for the Treatment of Cancer and Allied Diseases has announced that Dr. Cornelius P. Rhoads, an associate member of the Rockefeller Institute for Medical Research, has been appointed director of the hospital to succeed Dr. James Ewing, who will soon retire. Dr. Rhoads is 41 years old and graduated from Harvard Medical School in 1924. He has been on the staff of the institute since 1928. Dr. Ewing, who was professor of pathology at Cornell University Medical College from 1899 to 1932 and has since been professor of oncology, has been director of Memorial Hospital since 1932.

Grants for Research on Diabetes.—The New York Diabetes Association announces that it has available three grants up to $500 each for research in diabetes. These grants may be used for the purchase of apparatus and supplies needed for special investigations and for the payment of unusual expenses incident to such investigations, including technical assistance, but not for providing apparatus and materials which are ordinarily a part of laboratory equipment. The research must be carried out in Greater New York, though the men engaged in it need not be residents of Greater New York. There are no formal application blanks, but letters of application must state definitely the qualifications of the investigator, an accurate description of the proposed research, the amount requested and the specific use of the money to be expended. It is desirable to include a list of persons with whom the applicant has been associated and who would be willing to give letters of recommendation and sponsor the applicant. Applications should be mailed to the Committee on Research, New York Diabetes Association, Inc., 22 East Fortieth Street, New York. Applications will be received up to November 1.

OHIO

Society News.—Dr. Tinsley R. Harrison, Nashville, Tenn., addressed the Academy of Medicine of Cleveland and Cuyahoga County Medical Society September 15 on "The Clinical Approach to the Hypertensive Patient." —— Dr. Barney J. Hein, Toledo, addressed the Summit County Medical Society, Akron, September 5, on "Medical Economics as Viewed in Ohio." —— Dr. Russel G. Means, Columbus, addressed the Marion Academy of Medicine September 6 on "New Conceptions of Otitis Media."

Postgraduate Day in Canton.—The second annual Postgraduate Day sponsored by the Stark County Medical Society will be held in Canton October 11. The following members of the faculty of Jefferson Medical College, Philadelphia, will be the speakers:

Dr. George P. Müller, professor of surgery, Present Status of Surgical Treatment of Peptic Ulcer.
Dr. Martin F. Rehfuss, clinical professor of medicine, Medical Aspects of Gallbladder Disease.
Dr. Hobart R. Reimann, Magee professor of the practice of medicine and clinical medicine, Recent Developments in the Treatment of Pneumonia.
Dr. Brooke M. Anspach, professor of gynecology, Medical and Surgical Treatment of Pelvic Disease.

New Public Health Council.—Governor Bricker has appointed a new public health council in accordance with a new law reorganizing the state's health service. Members are Drs. Clyde L. Cummer, Cleveland; Ward D. Coffman, Zanesville; Russel G. Means, Columbus; Mrs. C. Tracy LaCost, Toledo, president of the Ohio Congress of Parents and Teachers; S. F. Ridings, D.D.S., Greenville, and Mr. William Helmer, sanitary engineer, Cincinnati. The new law requires that the state health director be appointed by the governor from a list recommended by the health council and that the health director cannot be removed except on recommendation of the health council. Dr. Roll H. Markwith, the incumbent director, was reappointed for the five year term set by the law.

PENNSYLVANIA

Medical Service Plan Chartered.—The Medical Service Association of Pennsylvania was chartered by the Dauphin County Court in Harrisburg September 7, newspapers report. The new plan is sponsored by the Medical Society of the State of Pennsylvania. Offices will be opened in Harrisburg and Philadelphia within a few weeks, it was said. Persons eligible for the service are those earning less than $40 a week if they have dependents and those earning less than $30 if they do not have dependents. Individual as well as group memberships will be available. Rates will begin at $2.50 a month for single persons, $4.50 for married couples, $1.50 for the first child and $1 for each additional child or dependent.

District Meeting.—The annual meeting of the Fifth Councilor District of the Medical Society of the State of Pennsylvania was held in Abbottstown at the Hanover Country Club August 24. Dr. Carl E. Ervin, Harrisburg, spoke on "Diabetes and the General Practitioner," and Drs. John J. Shaw, secretary, and Alexander H. Stewart, deputy secretary of health, explained the program and functions of the state department of health. Dr. David W. Thomas, Lock Haven, president, and Dr. Walter F. Donaldson, Pittsburgh, secretary of the state society, spoke on "Medicine Faces a Crisis" and "The National Scene" respectively; Dr. Chauncey L. Palmer, Pittsburgh, chairman of the society's committee on public legislation, "Public Assistance Medical Service in Review" and Mr. Lester H. Perry, Harrisburg, managing editor, *Pennsylvania Medical Journal*, "Insured Medical Service in Prospect."

SOUTH CAROLINA

Personal.—Dr. Archie B. Hooton, Upper Marlboro, Md., has been made health officer of Allendale and Hampton counties, taking over part of the work of Dr. Louis T. Claytor, who has been in charge of these counties as well as Barnwell and Bamberg counties. Dr. Claytor will remain as health officer of the latter two counties.——Dr. James C. Brabham, Johnsonville, has been appointed health officer of Lexington County. This county was formerly joined with Calhoun County in a health unit under the direction of Dr. Frank L. Geiger, St. Matthews, who remains in Calhoun County.

Society News.—Dr. Grady N. Coker, Canton, Ga., addressed a joint meeting of the Greenville County medical and dental societies in Greenville August 7 on "Modern Trends in Medical Practice" and George Albright, D.D.S., Greenville, on "Diseases and Accidents In and Around the Mouth." —— The

Columbia Medical Society held its August meeting at the South Carolina State Hospital with the following program by members of the staff: Drs. Chapman J. Milling on paranoia; Joe E. Freed and William S. Hall, metrazol therapy in mental diseases; John T. Cuttino, bromides—mental disorders, and William M. Fox, dementia paralytica.

American Legion Honors Dr. Wilson.—The American Legion, department of South Carolina, will confer its 1939 plaque for distinguished service to South Carolina on Dr. Robert Wilson, dean and professor of medicine, Medical College of the State of South Carolina, Charleston. Dr. Wilson graduated from the college in 1892 and has been associated with it since 1899, first as a member of the teaching staff and since 1908 as dean. He was president of the Medical Association of South Carolina, 1904-1905; Southern Medical Association, 1915-1916, and of the Tri-State Medical Association of the Carolinas and Virginia, 1927-1928. He was chairman of the state board of health from 1907 to 1931.

TENNESSEE

New Health Officers.—Dr. Robert D. Hollowell, health officer of Charlottesville and Albemarle County, Va., has been appointed health officer of Shelby County.——Dr. Albert L. Ball, Gallatin, has been appointed health officer of Bradley County to succeed Dr. William C. Sanford, Cleveland, who resigned.——Dr. James A. Loveless, recently of Chattanooga, has been appointed district health officer of Rhea-Meigs County, succeeding Dr. Edwin N. Haller, Decatur.

VIRGINIA

Personal.—Dr. Sylvester P. Gardner, Derby, was honored with a testimonial dinner given by friends at the Community Club House, Big Stone Gap, recently, marking his retirement after twenty-one years on the medical staff of the Stonega Coke and Coal Company.——Dr. Joseph Grice, Portsmouth, has resigned as medical director of the city schools and has been succeeded by Dr. Russell M. Cox.

Society News.—At the quarterly session of the Southside Virginia Medical Association in Burkeville September 12 the speakers were Drs. Thomas F. Wheeldon, Richmond, on "What Message Should the Specialist Carry to the General Practitioner in Regard to the Treatment of Arthritis?"; Warren T. Vaughan, Richmond, "Allergic Dermatoses"; Albert V. Crosby, Norfolk, "Penetrating Wounds of the Thorax"; James M. Hutcheson, Richmond, "Spontaneous Pneumothorax Simulating Acute Coronary Occlusion," and Arnold F. Strauss, Norfolk, "Epituberculosis."

State Medical Meeting in Richmond.—The Medical Society of Virginia will hold its seventieth annual session October 3-5 in Richmond with headquarters at the John Marshall Hotel. The house of delegates will meet Tuesday October 3. There will be general sessions Wednesday and Thursday mornings, medical and surgical sessions separately Wednesday afternoon and a general session Thursday afternoon followed by round table discussions. Speakers at the general sessions will be:

Dr. Franklin M. Hanger Jr., New York, Differential Diagnosis of Jaundice.
Dr. Eugene M. Landis, Charlottesville, subject not announced.
Dr. Charles H. Peterson, Roanoke, Diagnosis and Treatment of Mediastinal Tumors.
Dr. Henry B. Mulholland, Charlottesville, The Use of Protamine Insulin in Treatment of Diabetes Mellitus.
Dr. Richard P. Bell, Staunton, Experience with Thyroid Disease in Western Virginia.
Dr. Mont R. Reid, Cincinnati, The Cancer Problem.
Dr. Louis Hamman, Baltimore, a clinicopathologic conference.

Dr. Alexander F. Robertson Jr., Staunton, will deliver his presidential address at the opening session on "The Changing Era in Medical Economics." Dr. Claude Moore, Washington, D. C., will address the surgical section on "The Operability of Gastric Malignancy."

WASHINGTON

Society News.—Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will address a special meeting of the King County Medical Society, Seattle, September 28, at a luncheon at the Washington Athletic Club on "American Medicine and the National Government." Speakers at the regular meeting September 18 were Drs. John W. Geehan, on "Ruptured Abdominal Aortic Aneurysm Producing Intestinal Obstruction"; Joel W. Baker, "Carcinoma of the Colon," and Kenneth K. Sherwood, "Source, Distribution and Symptoms of Skeletal Metastasis."

GENERAL

Prevalence of Poliomyelitis.—The U. S. Public Health Service received reports of 479 cases of poliomyelitis in the United States during the week ended September 2 as compared with 391 the preceding week and a median of 333 for the corresponding week of the years 1934-1938. States with the highest incidence were: Michigan 109 cases, New York 100, Minnesota sixty, California fifty, Pennsylvania forty-four and Ohio eleven. New Jersey reported only ten cases for the week, Illinois nine, Texas eight and South Carolina six.

Food and Drug Officials Meet.—The forty-third annual conference of the Association of Food and Drug Officials of the United States will be held in Hartford, Conn., September 26-29 at the Bond Hotel. Among the speakers will be George R. Cowgill, Ph.D., New Haven, Conn., a member of the Council on Foods of the American Medical Association, on "Food and Drug Law Problems as Viewed by the Student of Nutrition"; Mr. W. G. Campbell, chief, U. S. Food and Drug Administration, Washington, D. C., "Looking Ahead in Food, Drug and Cosmetic Control," and Dr. Knox E. Miller of the Federal Trade Commission, Washington, "Advertising and the Consumer."

Society News.—Dr. Nathan H. Polmer, New Orleans, was chosen president-elect of the American Congress of Physical Therapy at the annual meeting in New York September 5-8 and Dr. William H. Schmidt, Philadelphia, was installed as president. Vice presidents elected were Drs. Fred B. Moor, Los Angeles; Kristian G. Hansson, New York; Miland E. Knapp, Minneapolis; Walter S. McClellan, Saratoga Springs, N. Y., and Walter J. Zeiter, Cleveland. Gold keys for research during the past year were awarded to Drs. Edward C. Titus and A. Bern Hirsh, New York; Joseph Rivière, Paris, and James B. Mennell, London. A gold medal was awarded to Dr. Henry W. Meyerding, Rochester, Minn., for an exhibit on etiologic factors in backache.

Look Out for Swindler Wanting Morphine.—A physician of New Rochelle, N. Y., reports a swindler who visits physicians to obtain morphine and atropine for asthmatic attacks and gives worthless checks in payment. The First National Bank of Philadelphia reported that more than thirty checks had been received from physicians in northern New Jersey, New York and the New England states. He uses the name Arthur G. Kuhn, is about 5 feet 8 inches tall and weighs about 130 pounds. He appears to have chronic asthma. He says that he is passing through a town on a truck, giving the name of a transportation company. In New Rochelle he gave the name of Langroth Transportation Company, 236 Spring Garden Avenue, Philadelphia. The Philadelphia bank reported that neither this firm nor the address could be located. In other instances he mentioned the Kuhn Express Delivery Service.

Government Services

Physicians Wanted for CCC Camps

A recent decision by the director of the Civilian Conservation Corps and the War Department permits the employment of physicians who are not medical reserve officers. Previously medical service in the CCC has been furnished by medical reserve officers with the exception of a few physicians employed on a contract basis. Employment may now be offered under the rating of civilian employees or on a contract basis, the initial pay being $2,600 a year. No quarters for families are provided and the physician will be required to pay for his meals at camps. Temporary quarters for him will be provided at a nominal fee. Those selected will be required to pay their own travel expenses to the nearest district headquarters, where they will be put on temporary duty for instructional purposes before being sent to camps. If the services rendered are satisfactory, the employment is more or less permanent. Duties at camps are the medical care of the enrollees and preventive medicine. To be eligible, a physician must be legally qualified to practice medicine and physically able to perform the duties. Physicians interested are requested to submit their applications to the office of the Surgeon, Headquarters, Seventh Corps Area, Federal Building, Omaha, giving the date when they will be available and preference of assignment in the following states: Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri, Kansas and Arkansas.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 4, 1939.

The War

We have been at war with Germany since yesterday. These letters are concerned only with the medical aspects and have previously dealt almost entirely with the arrangements for the defense of the civilian population against air raids: problems of organization even greater than those of the armed forces. After ten months of extraordinary effort a "knock out blow" against the most urbanized population of Europe has become impossible. Steel shelters to protect 6,500,000 people have been distributed free to dangerous areas and soon there will be sufficient for 10,000,000. Every firm employing more than fifty persons is compelled by law to plan suitable shelter for them. Arrangements were made for the transfer in four days from dangerous areas of 3,000,000 persons, including all the children, blind persons and expectant mothers, and for their feeding and medical care. For every hundred thousand persons there were sixty men and women trained in first aid work and forty men trained in rescue work. For civilian casualties 200,000 beds were available within twenty-four hours and the number will be increased to 300,000. Gas masks have been produced, fitted and distributed to the whole population, and protective helmets for babies to the number of 1,500,000. Busses, coaches and tradesmen's vans have been prepared in thousands for conversion into ambulances, and stretcher bearers and first aid personnel have been trained for them. A vast organization of trained and equipped observers, police and sirens renders a surprise attack impossible. The port of London has organized special protection for its 30,000 employees. Rationing of food will at once begin. For this purpose 80,000,000 ration cards and 19,000,000 forms for householders have already been printed. All this elaborate organization has been built up in four years and at an accelerated rate in the last year. For a week it has been ready for action at an hour's notice. Hundreds of thousands of trained civilians at their daily work are ready to become whole time workers in the plan if the order comes. The evacuation of the school children and others from dangerous areas, a scheme involving 30,000,000 persons which has never been performed on this scale in the history of the world, has been completed without a hitch and indeed with clocklike precision. The children were taken from the schools in coaches to the railway stations and to the country by trains reserved for them, ordinary traffic being largely suspended. As one train went out another took its place. First aid parties were in attendance but had little to do. The evacuation of the patients from the hospitals of London and other cities was performed with similar celerity and smoothness, according to prearranged plans. As typical may be taken the evacuation of the Middlesex Hospital, London. Coaches arrived at 9 a. m., for which patients on stretchers were waiting in the great hall. All the ambulant patients had been taken away in cars provided by friends of the hospital. There still remain a few patients too ill to be removed. A strong subbasement protected against gas is ready for the casualties of air raids. At Guy's and Bartholomew's hospitals, hundreds of students were to be seen engaged in stacking sandbags and completing other defensive arrangements.

Underground Operating Room in London

An underground operating room, for use in war time, is being built under the foundations of a new block of buildings at the Hospital for Sick Children, Great Ormond Street. The underground accommodation, the first of its kind in England, will consist of a receiving room with eighty seats and six dressing rooms where minor injuries can be treated; an operating room for major casualties with three tables and nine dressing and anesthetic cubicles; a duty room for the staff, and a sterilizing room. The electric light and water supply are from sources independent of the main service.

The Effect of Sulfonamide Derivatives on Aircraft Pilots

The fact that sulfonamide derivatives, by producing methemoglobin or sulfhemoglobin, may interfere with oxygen exchange of blood and so prove a danger to aircraft pilots is a subject of correspondence in the *British Medical Journal*. Dr. E. P. Mackie, medical adviser of Imperial Airways, saw a pilot who was suffering from symptoms of severe anoxemia as a result of flying at an altitude of only 13,000 feet. It was found that he had been taking full doses of sulfanilamide for tonsillitis. It is stated that a full dose of one of the sulfonamide derivatives taken shortly before flying lowers an aviator's "ceiling" by about 5,000 feet. Mackie therefore recommends that passengers, and more particularly members of the crew of an aircraft, should be warned against taking these drugs within a few days of flying.

Dr. A. F. Rook, Central Medical Establishment, Royal Air Force, refers to a personal communication received by him nearly two years ago from Dr. V. E. Lloyd, who found symptoms of intolerance from sulfanilamide in lorry drivers, which sometimes affected their judgment of speed and distance. Instructions were immediately issued to all medical officers of the Royal Air Force that no one should be allowed to fly or drive automobiles while taking these drugs. Similar cases have been observed in America and Germany.

Fracture Services

The committee appointed by the government on the rehabilitation of persons injured by accidents has presented its report. As fractures and allied injuries are by far the most important causes of disablement, they have received most attention. The system, universal until a comparatively recent date and still prevalent in the hospitals, by which fractures are treated in the general surgical wards and under general surgical routine is held to be gravely defective. Special fracture services should be organized throughout the country, as already has been done in a number of hospitals. They should be based on three principles: 1. All fractures, except those of the head, should be segregated in a single department. 2. The service should be operated and controlled by a single team under a surgeon in charge. 3. Treatment should be continued until restoration of working capacity has been effected to the fullest possible extent. While not dissenting from the view that a fracture service is susceptible of extension to other injuries, such as those of the hands and fingers, and may be ultimately desirable, the committee insists that a general traumatic service is not called for and under present conditions is impracticable. The modern fracture service should be based on concentration of cases in one department under single control, continuity of treatment and supervision until working capacity has been restored to the fullest possible extent. The principles of treatment aim at securing in every case exact reduction, fixation and immobilization of the broken part in correct position, and active movement from the earliest possible moment of the uninjured part of the limb, to prevent wastage of muscles and stiffness of joints.

In a hospital of from 500 to 1,000 beds the surgeon in charge of the fracture clinic should be paid an honorarium of $2,500, and in one of from 200 to 500 beds, $1,500. As the hospital is a voluntary one the surgeon would not receive any remuneration for his ordinary work, but it is pointed out that the surgeon in charge of a fracture clinic will have to undertake much more onerous and time-consuming duties than those usually falling to the lot of a visiting surgeon to a hospital.

RESTORATION OF FUNCTIONAL ACTIVITY

After-care following the surgical treatment for securing union of the fracture is held to be of vital importance and should be directed and supervised by the surgical team responsible for the initial treatment. Physical therapy is useful but occupational therapy may be more important and should be undertaken at rehabilitation centers rather than in hospitals. So far as hospital after-care is concerned, the provision of remedial exercises has mainly been considered. The fracture clinic should have its own gymnasium for remedial exercises and its own physical therapy department. But exercises, which are an essential part of the rehabilitation process, can be applied with limited accommodation and the simplest equipment.

UNDERGRADUATE AND GRADUATE INSTRUCTION

The committee holds that the training of students in fracture work is seriously deficient. A period of teaching in the fracture department, which should be part of every teaching hospital, should be obligatory. For graduate instruction the committee recommends (1) a session on fracture treatment to be regularly included in the refresher course for insurance practitioners and (2) a center for research and graduate instruction to be established in London.

PARIS

(From Our Regular Correspondent)

Aug. 12, 1939.

Fostering International Medical Relations

The general assembly of the Association for the Fostering of Medical Relations was held this year in the council chamber of the Faculty of Medicine of Paris with the minister of public health as chairman. This association was founded in 1922 to facilitate contacts between French physicians and their colleagues in other countries. Its first concern was to create, at the faculty of Paris, an information bureau to make medical visits to Paris useful to foreign physicians by furnishing information on courses, conferences and current medical facts. This information is furnished in different languages and by correspondence. Last year nearly 3,500 physicians from all parts of the world consulted it, not counting 2,000 others who made use of its services by mail. It is planned to create a sort of medical club for visiting physicians in the coming year. The association maintains a library, exchanges scientific publications, secures publicity abroad for important French articles and books, arranges visits of French physicians at foreign medical faculties and vice versa. It has organized courses in English and Spanish in the different branches of medicine.

Jayle, at the general assembly, remarked that our age is inferior to that of antiquity on the score of cultural friendship, because of the lack of a universal language such as Greek and Latin were formerly for the Western world or Arabic for the Eastern. The association, therefore, lays stress on the only means remaining to facilitate the mutual understanding of scholars, namely, the general use of English, German and French. Jayle related that when he was visiting one day in Berlin, Ehrlich invited him to attend one of his lectures and began to say in French "Gentlemen, we have the pleasure of receiving a Paris physician. I am going, therefore, to lecture in French and will then make some explanations in German for the few among us who do not understand French." The world has lost this charm and skill of linguistic readiness. One must recover these happy times. For this purpose, Jayle added, three essential tasks should be vigorously prosecuted: exchange of scientific publications, exchange of students and exchange of professors. This year American works will appear in the large French medical journals. The same applies to the interchange between France and Japan. In the exchange of students and professors, the language will always constitute the great obstacle. It is for this reason that a knowledge of foreign languages should be required of all students who intend to devote themselves to scholarship and research. Among these languages, the study of Greek and Latin ought not to be neglected, for "traveling through time is just as useful as traveling through space."

The Third French Congress of Ophthalmologists

The meeting of the third French Congress of Ophthalmologists took place in May. Coutela's paper dealt with the eye and occupational diseases. He showed how ocular lesions are related to other industrial accidents and intoxications due to manual work. Industrial dermatoses often predominate about the eyelid. Some of these dermatoses are purely toxic; others develop only when an individual predisposition is present. The number of mineral, animal, vegetable or chemical substances by which the eye or its adnexa can be injured has increased during the last years with the progress of industrial manufactures. Radiations, whether visible or invisible, natural or artificially produced, form part of the pathologic picture. Besides traumas, or lesions caused by external agents, the eye suffers during general intoxications. In certain diseases, such as miners' nystagmus and the ocular cramp of mechanics working with precision instruments, the oculomotor apparatus or the sensory elements of the visual apparatus alone are affected. Such conditions make necessary measures of industrial and medical prophylaxis and give rise to important medicolegal consequences.

Among other papers read, attention is called to the apparatus presented by Baillart and Bideau for measuring ocular temperatures during thermo-electrical connection and the description of the extraction of a cataract by means of Arraga's cupping glass, explained by Binet and De Saint Martin.

Meeting of Hydrologists

The sixteenth International Congress on Hydrology, Climatology and Medical Geology will be held at Strasbourg October 8-13. Among the questions to be discussed are those of the hydromineral therapy of dermatoses, mineral waters in petroliferous regions and the development of French thermal machinery in the last twenty years. Since France is at present under arms, the majority of scientific meetings scheduled for September have been postponed or canceled.

BERLIN

(From Our Regular Correspondent)

Aug. 10, 1939.

News of the Universities

Regulations affecting the universities are increasing in number. A new decree revises the regulations of the outside activities and fees of university teachers, e. g. those of university medical men and of academic experts with a private practice. The main features of this decree are as follows: Whenever university teachers are called to make investigations and to render expert opinions in matters pertaining to their specialty, without being under legal obligations to do so, their activity is to be regarded as within the sphere of their professional functions and requires no ministerial permission (THE JOURNAL, July 29, 1933, p. 381). Expert opinions rendered to foreigners as well as those rendered outside their academic specialty are subject to the approval of the minister of arts and sciences for the reich. Directors of university clinics are permitted privately to treat patients of the first and second classes (paying patients) and to charge a fee whenever patients prefer personal attention; otherwise, treatment of the patient can be taken care of by an assistant. In addition to this, directors of university clinics may maintain office hours, such as is usual for practitioners. However, if these office hours take place outside their clinics, ministerial permission must be sought. Beyond these possibilities, directors of university clinics may not engage in private practice; for example, they may not make professional calls

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at the home of the patient. For using state equipment, materials and personnel, directors must pay a certain percentage of their subsidiary income to the state treasury.

The German student body has resigned from the International Student Service, with which it had cooperated since 1936. The reason assigned was "that the service had manifested a growing anti-German tendency, especially in the sphere of social work among students. It was felt that the service concentrated its attentions on the 'German' students abroad who had preferred, from racial or political reasons, to leave Germany." (The International Student Service, as it is well known, has endeavored to assist students who were compelled to leave Germany.)

As pointed out previously, some universities had adopted regulations limiting enrolment (THE JOURNAL, May 8, 1937, p. 1664). These provisions, however, decreased university enrolment for academic vocations to such a degree that an annual deficit of from 5,000 to 8,000 students has resulted. In consequence, these entrance requirements have now been abolished and the way opened to unlimited enrolment. Besides, student attendance at the universities in most cases did not reach the quotas fixed: In 1933 Germany had 116,000 regular university students; in 1934, 95,000; finally, not even 60,000, an attendance insufficient to take care of the country's future professional needs.

The prospects for the higher education of women were recently discussed by Dr. Margarete Esch, academic and vocational adviser for women at the University of Berlin. The number of female students has greatly fallen since 1933. Of the 1,612 young women who began their studies in the winter semester of 1936-1937, 425 intended to become physicians.

The student session representing the whole of Germany that met in May in Würzburg considered the question of the higher education of women. Mrs. Scholtz-Klink, who occupies a leading position in the nationalistic party as leader of women for the reich (reichsfrauenführerin), emphasized that women engaged in work for the common good may not stint their work by evaluating too closely their own services; the present-day spirit and aim was to secure "a Germanic equality" of women with men. Women throughout the nation may engage in all types of work in which their strength is in keeping with the requirements of the job. The leader of the bureau dealing with female students nevertheless said that marriage and family remained woman's ultimate vocation. At this point the applause of the men in the audience was especially vigorous; likewise, when the speaker encouraged her comrades to enhance their charms by means of suitable clothes.

At this student session, apart from several manifestations of a political nature, the struggle for the control of university ideals was clearly reflected. Besides students from old Germany, Austrian and Sudetenland students were in evidence, clad in blue-gray shirts; and numerous so-called volksdeutsche studenten, that is, students of German descent belonging to other countries, among them those from Poland, wearing white shirts, black trousers and black ties. In addition there appeared a numerous group of young fascists and Japanese, South African, Finnish, Hungarian, Bulgarian and Yugoslavian contingents. In place of the student clubs that formerly existed and boasted honored traditions and names and which had been abolished when the present political party came into power, the new "comradeships" that had taken their place were at this time given partly historical names like Hutten, York, Körner and Bismarck, partly names of "martyrs in the national socialistic cause," though these had no connection whatever with education. Reich's leader Alfred Rosenberg admitted that there had existed in the earlier history of Germany great epochs that were molded by Christianity, but at the same time he made it clear that these epochs represented bygone and closed movements with which the Germans of today had no direct connection. The awakening of the German nation had been so profound that the German people had broken with these traditions. However, national socialism, he went on to say, motivated by traditional ties, had refrained from destroying monuments that embodied a great epoch of the past. The touch-stone of loyalty to the party in power was, he said, to make an issue of Judaism. This issue had to be fought to its bitter consequences without relenting.

The great majority of universities and their representatives assumed a negative attitude toward national socialism in 1933 or at least temporized. Consequently, when national socialism took over political power, the differences between the previously dominating cultural stratum of society and the new political leadership appeared to be greater than ever before. Not only the traditional forms of student life but also the universities with their claims to scientific objectivity and intellectual autonomy were drawn into the current of the new social forces. The picture of the universities has greatly changed within the last six years. About 45 per cent of the university teachers, as Professor Mentzel, the new leader of the division of arts and sciences in the department of education of the reich, announced, were replaced either for political reasons or on account of old age.

The unrest of the first years after 1933 in university life is now regarded in leading circles as terminated. Nevertheless, the students do not consider the revolution of the universities as concluded and in decisive positions as not even begun. The underlying causes cannot be fully understood at first glance. The ultimate aim is a fundamental revision of all values heretofore regarded as of absolute applicability, such as "mind" and "education." These terms, it is said, require a new national socialistic interpretation to mediate between a onesided acceptance and a premature rejection. Not until this has been done will the universities take the position due them among the important factors of the third reich. Scientific research, the national socialists say, has in the past been reproached with having become estranged from the common life of the people. Nazi students, on the other hand, have moved it closer, often into proximity with the political tasks of the nation. Science and scholarship are not to be subordinated to politics but fitted into it just as culture today is regarded as a part of character training. This, however, in reality implies a new gradation of values. Instinct and energy are not to be dominated but supported and strengthened by knowledge. Knowledge is to be put at the service of instinct and energy. It is in this direction that national socialism guides the mental life of the students.

ITALY

(From Our Regular Correspondent)

Aug. 15, 1939.

International Congress of Comparative Pathology

The fourth International Congress of Comparative Pathology was held recently in Rome. The royal family, the academicians of Italy and representatives of the Italian universities were present. The first official topic was virus diseases. Professor Lépine discussed immunity to virus diseases. Professors Stanley and Loring spoke on the properties and nature of purified virus. Large amounts of crystalline, purified virus have been obtained from the tobacco mosaic. Its activity depends on its protein structure. There are two theories on the nature of the viruses, namely (1) that they are autocatalysts and (2) that they are living agents of intramolecular (rather than of intermolecular) structure which originate in abiogenesis or else from organisms in retrograde evolution.

The second topic concerned functions of associated antigens in relation to immunity. Professor Lanfranchi has proved that Bacillus subtilis fixes the virus of influenza equina in vitro and also that Bacillus subtilis antigen is useful for the production of immunity against influenza in horses. Professor Marrack spoke on the reactions between antigens and antibodies. Professor Ramon said that he observed that the value

of specific immunity increases when the antigen is administered in association with a stimulating substance which causes a local inflammation at the point of the injection. The diffusion of the toxin is gradual, owing to the presence of the reaction, and the resulting antitoxic immunity develops more quickly and intensely. The method has been used to obtain rapidly strong antitoxic serums, in the vaccination of animals against tetanus and for a better preparation of anticarbuncle vaccines. Since the establishment of a "synergy between antigens," the knowledge on immunity has progressed so that it is possible at present to perform multiple immunizations of reciprocal reinforcing action by means of only one series of injections.

The subject of the third topic was pathologic heredity. Professor Hirszfeld spoke on serologic mutations in the formation of blood groups. Iso-agglutinability of erythrocytes of the blood of group O can be due to incomplete mutation of hereditary factors (genes) of the O type. Professor Chiarugi discussed vegetal pathology in relation to human pathology. The immunity and morbidity of persons who are in contact with pathogenic agents depend on the individual secretion of specific factors by which either the organic resistance or the susceptibility to the disease is increased. The degree of pathogenicity of the parasites is also in genetic gradation. Therefore diseases are the result of the interference of genetic factors of the host and of the parasites. The hereditary resistance of plants to diseases can be increased by hybridization of samples and selection of hybrid plants.

For the fourth topic there was a discussion on processes of regression in plants.

Antidiphtheritic Vaccination

The legislative committee of the Upper House of Representatives assembled to discuss the advisability of making antidiphtheritic vaccination compulsory. Prof. Buffarini Guidi, subsecretary of state for internal affairs, said that the principle of making the vaccine compulsory has been established in Italy for the last few years. There was a ministerial law in 1929 by which the local authorities had the right to make vaccination compulsory whenever it would seem advisable for prevention of diphtheria. The department of public health, before presenting the project to the house, asked for advice from eminent groups of technicians, especially members of the Council of Public Health, and other medical authorities. In numerous cities and provinces in which the vaccination has been compulsory, there has been no inconvenience and no harm has been done up to now. The vaccine is prepared under supervision of the government. The number of people in Italy who have been vaccinated is about 300,000. Several senators took part in the discussion, after which the project of law was approved.

Research on Peyote

Professor Palmieri, head of the Istituto di Medicina legale of the University of Bari, carried on systematic researches on the toxicity of mezcaline and of the total extract of peyote (Echinocactus williamsi). He reported his results before the first Congress of Social and Legal Medicine, recently held in Bonn.

Peyote is a native cactus of the southern part of the United States and northern part of Mexico. The drug was ingested by natives in the precolumbian era as a sacred plant in certain ceremonies. Some native Mexican groups still use it.

Peyote produces a state of intoxication with two different phases: one of general stimulation with euphoria and the other of cerebral and physical depression. The latter phase is associated with colorful visual hallucinations, without loss of consciousness. Peyote contains alkaloids, especially mezcaline. The speaker injected mezcaline sulfate in a group of animals in doses of 1 Gm. of mezcaline for each kilogram of body weight. The drug induced rare symptoms and killed the animals within an hour. At necropsy, all the organs of the animals were congested. The lung showed zones of emphysema, and intra-alveolar infiltration of round nucleated cells which had a poor content of chromatin. The lumen of the alveoli was diminished but empty. The liver was in a condition of vacuolar degeneration. The kidneys were nephrotic and showed small hemorrhages, especially in the cortex. The adrenals were the seat of a process of steatosis. Another group of animals had the injection of mezcaline sulfate in daily doses of 0.3 Gm. for each kilogram of body weight. The animals died within fourteen to eighteen days with rare symptoms. The anatomic and histopathologic lesions were of the same type, nature and intensity as those which were seen in the animals killed by acute intoxication. However, in the animals which had a mild intoxication, lesions of degeneration prevailed over those of congestion. The blood of the animals with the acute intoxication did not show alterations. The erythrocytes were diminished and there was a certain degree of leukopenia in the animals that had the chronic intoxication.

Society Reunion

At the Società Napoletana di chirurgia, Dr. Tarantino spoke on hydremia and chloridemia in experimental acute intestinal occlusion, in relation to the behavior of the adrenals. He found that interruption of the duodenum is followed by a diminution of the amount of water and chlorides in the blood. If the animals are previously prepared by administration of adrenal extracts or by transplantation of adrenals before the operation, the variations of hydremia and chloridemia are within physiologic figures. The speaker concluded that the diminution of water and chlorides in the blood of patients who suffer from intestinal occlusion is due to functional disorders of the adrenals.

Professor Giliberti reported results of experiments with Gordon's test for malignant lymphogranuloma. The speaker found that the intracerebral inoculation of a suspension of lymph nodes with malignant lymphogranuloma in broth induces in rabbits meningo-encephalitis of the type described by Gordon. The suspension of malignant lymphogranuloma retains the pathogenic power even when it is filtered through a Berkefeld N filter. The filtrate resists for forty-eight hours the irradiations with 5 mg. of radium. The intracerebral inoculation of suspensions of lymph nodes with disease other than malignant lymphogranuloma did not cause meningo-encephalitis of Gordon's type. The speaker said that Gordon's test is of diagnostic value but has no value in clarifying the etiology of malignant lymphogranuloma.

Marriages

ARTHUR LAGRANGE VAN NAME JR., Center Cross, Va., to Miss Grace Alma Cluverious of Little Plymouth in July.

SIDNEY GREY PAGE JR., Richmond, Va., to Miss Maysville Jane Owens of Cumberland, Md., June 24.

JAMES JOSEPH MCSHEA, Norristown, Pa., to Miss Marcella Rose Marie Furey of Coaldale, June 14.

ASA WING POTTS, Philadelphia, to Miss Marian Carl Sharpless of Rosemont, Pa., July 18.

BERTRAM J. BOUQUET to Miss Dorothy Miller, both of Wahasha, Minn., June 7.

WAIT R. GRISWOLD, Indianapolis, to Miss Alene Daugherty of Paoli, Ind., May 14.

JOSEPH F. RICCHIUTI to Miss Kathleen Ryan, both of Mahanoy City, Pa., recently.

BENJAMIN J. MALNEKOFF to Miss E. Patricia Weller, both of Milwaukee, May 28.

JOHN WESLEY PRATT II, Coatesville, Pa., to Miss Charlotte W. Hand, June 3.

DAVID SLUSS to Miss Inez Jeffries, both of Indianapolis, July 1.

Deaths

Harold Levi Rypins ● Albany, N. Y.; Harvard Medical School, Boston, 1919; assistant professor of medicine at the Albany Medical College and formerly associate and instructor in medicine; instructor in medicine, University of Minnesota Medical School, Minneapolis, 1920-1923; secretary of the New York State Board of Medical Examiners; past president of the Federation of State Medical Boards of the United States; member of the National Board of Medical Examiners; member of the executive committee of the Advisory Council on Medical Education; executive secretary of the medical grievance committee of the state education department; fellow of the American College of Physicians; on the staff of the Albany Hospital; aged 46; died, August 25, at Atlantic Beach, L. I.

Josiah Shaftesbury Davies ● Tacoma, Wash.; University of Nebraska College of Medicine, Omaha, 1903; member of the American Academy of Ophthalmology and Otolaryngology and the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; served during the World War; on the staffs of the Tacoma General Hospital, St. Joseph's Hospital, Pierce County Hospital, Tacoma, and the Mountain View Sanatorium, Lakeview; aged 60; died, July 11, at Steilacoom Lake of coronary thrombosis.

George W. H. Hemmeter ● Baltimore; University of Maryland School of Medicine, Baltimore, 1901; health officer of the Western health district of Baltimore; formerly instructor and demonstrator in the physiologic laboratories of the University of Maryland and the Maryland Medical College; at one time professor of physiology at the Woman's Medical College of Baltimore; aged 63; died, July 12, in the Johns Hopkins Hospital of carcinoma of the bladder.

Louis Heitzmann ● New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1885; since 1922 emeritus professor of pathology at the New York Medical College and Flower Hospital; professor of bacteriology and pathology at the Fordham University School of Medicine, 1916-1919; member of the American Urological Association; author of "Urinary Analysis and Diagnosis"; aged 75; died, July 9.

Homer Alanson Millard ● Minonk, Ill.; Hahnemann Medical College and Hospital, Chicago, 1890; past president and secretary of the Woodford County Medical Society; for many years member of the school board; served during the World War; at various times on the staffs of St. Mary's Hospital, Streator, Mennonite Hospital, Bloomington, and the Brokaw Hospital, Normal; aged 72; died, July 18, of aplastic anemia.

Delos Edward Cornwall ● St. Maries, Idaho; Rush Medical College, Chicago, 1907; past president of the Idaho State Medical Association; president of the Pacific Northwest Medical Association; formerly member of the state board of medical examiners; district surgeon to the Chicago, Milwaukee, St. Paul and Pacific Railway; aged 56; medical director of St. Maries Hospital, where he died, July 5, of coronary occlusion.

James Alfred Watson ● Minneapolis; Manitoba Medical College, Winnipeg, Man., Canada, 1895; member of the American Academy of Ophthalmology and Otolaryngology; past president of the Minnesota Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staffs of the Asbury and Fairview hospitals; aged 71; died, June 17, of coronary thrombosis.

William Travis Gibb ● New York; University of the City of New York Medical Department, 1886; instructor of gynecology at his alma mater, 1889-1898; fellow of the American College of Surgeons; served at various times and in various capacities on the staffs of St. Elizabeth's Hospital, New York City Hospital and the Central Neurological Hospital; aged 76; died, July 6.

Simon A. B. Berglund, Marinette, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; member of the State Medical Society of Wisconsin; served during the World War; formerly health officer; aged 58; on the staff of the Marinette and Menominee Hospital, where he died, July 2, of acute gangrenous stomatitis.

Sidney Clarence Keller ● Newark, N. J.; Columbia University College of Physicians and Surgeons, New York, 1905; member of the American Urological Association; on the staffs of the Beth Israel Hospital, City Hospital, St. James' Hospital and the Newark Memorial Hospital; aged 58; died, July 7, of coronary occlusion.

William Freile ● Jersey City, N. J.; Bellevue Hospital Medical College, New York, 1898; fellow of the American College of Surgeons; past president of the Hudson County Medical Society; on the staffs of the Christ Hospital and the Medical Center of New Jersey; aged 65; died, July 3, of congestive heart disease.

George Randolph Fox, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1887; past president and formerly secretary of the Avoyelles Parish Medical Society; at one time mayor of Moreauville; aged 75; died, July 7, at the Touro Infirmary of bronchopneumonia.

Raoul R. Haas, Chicago; Chicago Homeopathic Medical College, 1903; Northwestern University Medical School, Chicago, 1906; staff surgeon to the West Side Hospital and the House of Correction Hospital; aged 59; died, July 21, at Cadillac, Mich., of myocarditis and chronic nephritis.

Alexander J. MacKenzie ● Port Huron, Mich.; Detroit College of Medicine, 1904; past president of St. Clair County Medical Society; fellow of the American College of Surgeons; chief of staff of the Port Huron Hospital; aged 61; died, July 19, while on his boat at Killarney, Ont., Canada.

Austin Samuel Johnson ● Indianapolis; University of Michigan Medical School, Ann Arbor, 1924; on the staffs of the Methodist, City and William H. Coleman hospitals and the Suemma Coleman Home; served during the World War; aged 42; died, July 1, of coronary thrombosis.

Albert Elmo Jones, Kansas City, Mo.; University Medical College of Kansas City, Mo., 1908; member of the Missouri State Medical Association; served during the World War; aged 53; died, July 16, in the Veterans Administration Facility, North Little Rock, Ark., of coronary occlusion.

Herbert Mann, Richmond, Va.; Medical College of Virginia, Richmond, 1903; veteran of the Spanish-American War; instructor in the practice of surgery, Medical College of Virginia, for the sessions 1905-1909; physician in charge of the Penitentiary Hospital; died, July 7.

Everett Monroe Ellison ● Washington, D. C.; George Washington University School of Medicine, Washington, D. C., 1912; on the visiting staffs of the Gallinger and George Washington University hospitals; aged 60; died, July 24, in Mexico, where he had been vacationing.

Edward Henry Flynn, Marquette, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1881; health officer, 1912-1913; aged 79; formerly on the staff of St. Mary's Hospital, where he died, July 1, of hypostatic pneumonia and arteriosclerosis.

Walter James Kirby, Miami, Fla.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1912; member of the Ohio State Medical Association; served during the World War; aged 60; died, July 10, in the Jackson Memorial Hospital of coronary occlusion.

Palmer Lee Carlton, Covington, Ky.; Louisville (Ky.) Medical College, 1901; member of the Kentucky State Medical Association; on the staffs of the William Booth Memorial Hospital and St. Elizabeth Hospital; aged 57; died, July 13, of coronary thrombosis.

Edward Joseph Moore ● Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1899; medical director of the Pennsylvania Mutual Life Insurance Company; aged 64; died, June 9, in the Jefferson Hospital of chronic myocarditis.

Edward Jerome Lavin, Baltimore; Temple University School of Medicine, Philadelphia, 1933; member of the Medical Society of the State of Pennsylvania; resident to the Bon Secours Hospital; aged 36; died, July 14, of coronary sclerosis.

Enoch McLain Causey, Franklinton, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1908; member of the Louisiana State Medical Society; aged 60; died, July 11, in Shreveport of uremia and arteriosclerotic heart disease.

Oliver Joseph La Fontaine ● Chaumont, N. Y.; University of the City of New York Medical Department, 1894; was health officer of Chaumont from 1915 to 1936 and since 1923 health officer of Lyme; aged 72; died, June 17.

George J. L. Haumesser, Shumway, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1881; at various times president and member of the village board, justice of the peace and county coroner; aged 81; died, July 8, in Alton.

Charles Oliver Gamble, Paris, Texas; Howard University College of Medicine, Washington, D. C., 1906; aged 63; died, July 4, in the Veterans Administration Facility, Hines, Ill., of carcinoma of the head of the pancreas.

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Edson B. Hart, Bloomington, Ill.; Northwestern University Medical School, Chicago, 1900; member of the Illinois State Medical Society; on the staff of the Brokaw Hospital, Normal; aged 67; died, July 18, of coronary occlusion.

Frank Weeden Mathewson ● New Bedford, Mass.; Boston University School of Medicine, 1914; served during the World War; aged 48; died, July 6, in St. Luke's Hospital of burns received when his clothing caught fire.

Frank Clarence Heffner ● Cincinnati; Medical College of Ohio, Cincinnati, 1908; aged 53; at various times on the staffs of the Christ Hospital, General Hospital and the Good Samaritan Hospital, where he died, July 10.

Lyle Bruce Hart, Beckley, W. Va.; Rush Medical College, Chicago, 1936; member of the West Virginia State Medical Association; aged 30; on the staff of the Beckley Hospital, where he died, July 6, of carcinoma.

Haliburton McCoy, Puumene, Hawaii; University of Virginia Department of Medicine, Charlottesville, 1918; member of the Hawaii Territorial Medical Association; served during the World War; aged 49; died, July 2.

Edwin Bayard Fisher, Medicine Hat, Alta., Canada; University of Edinburgh Faculty of Medicine, Scotland, 1892; University of Toronto Faculty of Medicine, 1894; aged 71; died, June 9, of cerebral hemorrhage.

Charles Arthur Lapierre, Minneapolis; M.B., School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1890, and M.D., 1892; aged 68; died, June 29, of uremia.

Hiram Kilgore McConnell, Gate City, Va.; Hospital College of Medicine, Louisville, Ky., 1907; member of the Medical Society of Virginia; county coroner; aged 58; died, July 14, in a hospital at Richmond.

Adoniram Judson Chalkley, Lexington, Mo.; Washington University School of Medicine, St. Louis, 1905; member of the Missouri State Medical Association; aged 61; died, July 3, of chronic encephalitis.

Louis John Ferenczi ● Bayonne, N. J.; Dartmouth Medical School, Hanover, N. H., 1913; aged 48; on the staff of the Bayonne Hospital, where he died, July 18, of carotid aneurysm and cerebral atrophy.

Chalmers Alexander Hill ● Council Bluffs, Iowa; Northwestern University Medical School, Chicago, 1907; served during the World War; aged 60; died, July 9, of pneumonia and cerebral hemorrhage.

Clarence Hunter Harris, Louisville, Ky.; Louisville Medical College, 1891; past president of the Jefferson County Medical Society; formerly city and county health officer; aged 68; died, July 8.

George William Carter, Alexandria, Va.; University of Maryland School of Medicine, Baltimore, 1878; aged 84; died, July 20, in Jacksonville, Fla., of uremia and hypertrophy of the prostate.

Edward Pierce Lockart, Norway, Mich.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1883; health officer; formerly mayor; aged 81; died, July 10.

Robert Sweney Dombaugh, Marion, Ohio; Columbus Medical College, 1891; member of the Ohio State Medical Association; aged 70; died, July 1, of leukemia and acute hepatitis.

John Aloysius Mogenhan ● Rochester, N. Y.; University of Buffalo School of Medicine, 1921; on the staff of St. Mary's Hospital; aged 45; died, June 2, of pulmonary tuberculosis.

Frederick Forest Budd, New Haven, Conn.; Yale University School of Medicine, New Haven, 1903; served during the World War; aged 58; died, June 13, of heart disease.

William A. Fankboner ● Marion, Ind.; Rush Medical College, Chicago, 1891; aged 78; on the visiting staff of the Marion General Hospital, where he died, July 14, of carcinoma.

Llewellyn Williams Lord ● Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1925; aged 38; died, July 4, of illuminating gas poisoning, self administered.

William L. Hammersley, Frankfort, Ind.; Baltimore Medical College, 1898; aged 70; died, July 18, in the Methodist Episcopal Hospital, Indianapolis, of coronary occlusion.

Oscar Batteiger Herbein, Strausstown, Pa.; Jefferson Medical College of Philadelphia, 1896; aged 70; died, June 18, in the Reading (Pa.) Hospital of heart disease.

George Matthew Ferris, Cobourg, Ont., Canada; Trinity Medical College, Toronto, 1894; University of Toronto Faculty of Medicine, 1894; aged 68; died, July 23.

Henry William Stephenson Kemp, Brooklyn; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1906; aged 54; died, July 16, in Bradenton, Fla.

Eli Ellis, Brooklyn; New York Medical College and Flower Hospital, New York, 1934; aged 31; died, June 20, in the Manhattan Eye and Ear Hospital, New York.

Wellington Montelle Carrick, Hamilton, Ont., Canada; University of Toronto Faculty of Medicine, 1905; served during the World War; aged 54; died, July 2.

Reuben William Bennett, Gretna, Va.; University College of Medicine, Richmond, 1899; member of the Medical Society of Virginia; aged 63; died, July 13.

Carl Ludwig Ambos ● New York; Cornell University Medical College, New York, 1900; on the staff of the Royal Hospital; aged 66; died, July 23.

Charles Herbert Carruthers, Florence, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1919; aged 43; died, July 4, of heart disease.

Charles Cunningham Campbell, Youngstown, Ohio; Western Pennsylvania Medical College, Pittsburgh, 1896; aged 72; died, July 14, of heart disease.

Isadore Mogil ● New York; Fordham University School of Medicine, New York, 1916; on the staff of the Bronx Hospital; aged 49; died, June 15.

Ulysses L. Dearman ● Reedy, W. Va.; Kentucky University Medical Department, Louisville, 1906; aged 71; died, July 11, of heart disease.

George Washington Park, Canton, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1888; aged 84; died, June 24, of senility.

Charles Morrill Kent, Forestville, Conn.; Bellevue Hospital Medical College, New York, 1888; aged 74; died, June 13, of coronary thrombosis.

Paul Kahn ● Frankenmuth, Mich.; Baltimore University School of Medicine, 1896; aged 70; died, July 17, in St. Mary's Hospital, Saginaw.

Newton J. Benson, Indianapolis; University of Louisville (Ky.) Medical Department, 1875; aged 91; died, July 8, at Lawrenceville, Ill.

Patrick Joseph Murray, Boston; Boston University School of Medicine, 1908; aged 63; died, July 19, in the New England Baptist Hospital.

Frederick William Koons, Dormont, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1907; aged 64; died, June 26.

Joseph Krost, Chicago; Rush Medical College, Chicago, 1881; member of the Illinois State Medical Society; aged 79; died, July 20.

Robert Gordon Duncan, Bathurst, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., 1898; aged 63; died, June 26.

Herbert Edgar Johnson, Mount Albert, Ont., Canada; University of Toronto Faculty of Medicine, 1910; aged 60; died, June 6.

Franklin J. Gustine, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1883; aged 77; died, July 9.

Thornton Riggs Williams, Bala-Cynwyd, Pa.; College of Physicians and Surgeons, Baltimore, 1882; aged 88; died, June 23.

Orcutt Nathan Carr, Oak Park, Ill.; Jenner Medical College, Chicago, 1898; aged 69; died, July 4, of Parkinson's disease.

William Marion Duff, Braden, Okla.; University of Arkansas School of Medicine, Little Rock, 1911; aged 66; died in June.

James Andrew Shaffer, Hazen, Pa.; Cleveland Medical College, 1896; served during the World War; aged 66; died in June.

Frederick T. Gorton, Portage, Wis.; Hahnemann Medical College and Hospital, Chicago, 1883; aged 79; died, June 16.

Joseph F. Shemwell ● Baltimore; University of Maryland School of Medicine, Baltimore, 1889; aged 75; died, June 25.

Christopher N. D. Campbell, Greenwood, Miss.; Louisville (Ky.) Medical College, 1884; aged 76; died, June 27.

Harry C. Diltz, Wilkinsburg, Pa.; Medico-Chirurgical College of Philadelphia, 1893; aged 70; died, June 9.

Frank Pollard, Los Angeles; Marion-Sims College of Medicine, St. Louis, 1891; aged 72; died, June 13.

G. L. Francis, Nettleton, Miss.; licensed in Mississippi, year unknown; aged 74; died, June 15.

Correspondence

TREATMENT OF BROMIDE INTOXICATION

To the Editor:—In an otherwise excellent article on bromide intoxication (THE JOURNAL, August 5, p. 466) Dr. Gundry fails to mention an important point in treatment. He suggests sodium chloride by mouth or parenterally to replace the bromide in the system but no note is made of gastric aspiration.

Ordinarily the bromides are eliminated by the kidneys, but Otto E. Toenhart (*Wisconsin M. J.* **12**:901 [Dec.] 1935) points out that hydrobromic acid is secreted by the stomach in approximately the same ratio to hydrochloric acid as that of the salts in the blood. By using continuous gastric lavage he prevents reabsorption and materially hastens elimination of the bromides from the body.

During the past two years Dr. E. D. Hoedemaker and I have had occasion to use continuous gastric aspiration in at least twelve cases of bromide psychosis, with gratifying results. The use of sodium chloride alone necessitates from two to six weeks of treatment, but with gastric aspiration the bromides are eliminated in from two to seven days, materially shortening the duration of the intoxication. A continuous drainage with negative pressure bottles is simple and efficacious. Of course, gastric achlorhydria invalidates gastric aspiration and accounted for the failure of this therapy in two of our cases.

FREDERICK LEMERE, M.D., Seattle.

EMBOLISM FOLLOWING KNEE-CHEST POSITION POST PARTUM

To the Editor:—The article in THE JOURNAL August 19 on this subject leaves many questions of doubt as to whether the emboli of air were due to air sucked in at the time that the knee-chest posture was assumed.

The explanation of the modus operandi of the air getting into the vessels is far from convincing when the condition of the uterine muscle and its interior and the question of physics are considered.

The vagina is a membranous pouch which may be expanded with air with the subject in the knee-chest posture by suction exerted when the abdominal viscera drop toward the chest. The uterus is a heavy, thick walled muscular organ the tendency of which is to contract rather than dilate, and it is questionable whether the weight of the viscera would be sufficient to cause dilatation enough to fill the uterus with air, as it has a tendency to follow the viscera as they drop toward the chest.

It is stated that the uterine sinuses were covered by a clot. This clot would act as a ball valve under pressure and cause closure of the sinuses while the air pressure was maintained. They were naturally found open after removal of the clot in the relaxed dead subject.

It is stated that, when the uterine wall was carefully opened, air escaped from the tissues. How much air pressure would it require to force air from the vagina into the living tissues of the uterine wall? It must be taken into consideration that the least amount of air pressure on the surface of the endometrium would compress it, making it less pervious to air, and the more the pressure the more impervious it would become until the uterine wall gave way.

The simile of the bellows can be used to disprove his explanation of the mechanics of the air entering the sinuses. If one punctures the fabric of the bellows, making a hole the size of the uterine vein, how much air pressure can one get from this hole when the nozzle is left open? If it is assumed that the veins are rigid, noncollapsible tubes from the uterus to the heart, it may be conceived that air would enter them before escaping through the more or less flaccid larger openings of the cervix and the vulva or the tubes, but the veins collapse and every heart beat increases the vacuum pressure from collapse of the tissues around them to keep them closed. A person will bleed to death from a severed large vein, but there is no air embolism from the heart sucking air into the vein.

It is not stated whether a bacteriologic study was made of the tissues. With manual invasion of the uterine cavity the amount of postpartum débris found, the spongy air-filled condition of the uterine wall and the length of time post partum, a gas bacillus invasion would seem to be suggested and the knee-chest position merely coincidental and misleading.

E. P. HUMMEL, M.D., Sterling, Colo.

A CONVENIENT POSITION FOR SIGMOIDOSCOPY

To the Editor:—For twenty-five years I have employed for patients, and taught my interns to employ, a special position for the use of the sigmoidoscope. While the knee-chest is an acceptable position for men, it is less acceptable for women, especially corpulent ones, and impossible for the sick and weak and for those confined to bed. But I have discovered that many who use the sigmoidoscope do not know of this position, so I am describing it herewith.

The patient lies on the left side across the examining couch or bed, with the buttocks hanging slightly over the edge, the legs drawn up and the back not straight across but at an angle of 10 or 15 degrees to the edge of the bed, so that the shoulders are in advance of the buttocks. It is not a Sims position, for both arms are forward in front of the chest, so that the patient lies squarely on the left shoulder, and the legs are drawn up together on the bed.

The patient is not unduly exposed, is comfortable, and even though sick and weak can stand a prolonged examination when this is necessary.

It might seem that this position would increase the rectosigmoid angle and so increase the difficulty of inserting the tube into the sigmoid flexure, but in comparative tests with the same patient I have rarely found any difference in the distance to which the tube could be inserted. It makes sigmoidoscopy a very easy process for the patient.

WALTER A. BASTEDO, M.D., New York.

ACETYLCHOLINE IN PAROXYSMAL TACHYCARDIA

To the Editor:—I read with interest the communication from Isaac Starr (THE JOURNAL, August 5, p. 527) of the Department of Research Therapeutics, University of Pennsylvania School of Medicine, regarding the use of acetylcholine in paroxysmal attacks of tachycardia in which he states that "one would suppose from reading the answer that acetylcholine would stop attacks of paroxysmal tachycardia when given in doses of from 20 to 30 mg. subcutaneously. . . . This is completely erroneous . . . and there is no valid evidence that it has ever stopped an attack of tachycardia."

I heartily agree with Dr. Starr that administration of the drug subcutaneously has probably never stopped paroxysmal tachycardia. I have, however, observed five cases of paroxysmal tachycardia in which I used the drug intravenously in doses of 0.1 Gm., and in each instance it stopped the paroxysmal tachycardia immediately and this with little if any of the terrific side effects that one gets from mecholyl (flushing, salivation, sweating and hyperperistalsis). In fact, I used it on one patient for three separate attacks of paroxysmal tachycardia and it stopped the attack immediately and abruptly each time.

My personal experience with mecholyl has been quite disappointing in that the side effects were very severe every time.

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The effect of the drug on the paroxysmal tachycardia far from approached that of acetylcholine. I observed a patient under the care of another physician who was given mecholyl for paroxysmal tachycardia and the patient promptly died.

I agree with Dr. Starr that "it is essential that physicians distinguish between" acetylcholine and acetyl-β-methylcholine, and particularly that the dangers of mecholyl be thoroughly understood by the physician before he uses it.

KENNETH H. ABBOTT, M.D., Ontario, Calif.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

OLEOTHORAX

To the Editor:—Please discuss the oil treatment in tuberculosis.

R. E. Dupre, M.D., Ville Platte, La.

ANSWER.—It is assumed that what is meant is the use of oil in the pleural cavity. In 1922 Bernou advocated the introduction of oil for pleuropulmonary fistulas of the valve type and in other cases presenting small openings. He believed that massive quantities of antiseptic oil should be employed and named the method of treatment "oleothorax." Since that time a large volume of work has been done on this subject in various parts of the world. In this country, Matson discussed the subject and reported a large number of cases (*Am. Rev. Tuberc.* **25**:419 [April] 1932). He presented an elaborate discussion of the indications and a detailed description of the technic of administration. Different preparations of oil have been employed by various workers, such as cajuput oil in liquid petrolatum, olive oil or wesson oil. When cajuput oil is added, it is in a strength varying from 1 per cent to 10 per cent. Many workers today use plain liquid petrolatum or olive oil without cajuput oil.

In more recent times oleothorax has been used in the treatment of tuberculous empyema which develops in patients with pneumothorax. In such cases the empyema cavity is drained as completely as possible by the simple aspiration method and oil is gradually introduced into the pleural cavity. At the first sitting it is well to introduce only a few cubic centimeters to determine whether any reaction occurs. If cajuput oil is being used, one must be extremely cautious by introducing small amounts at first. If no reaction occurs, one may introduce in twenty-four hours a larger amount and gradually increase it until the pleural space is almost filled. In cases in which pus has been forming rather rapidly, one should always leave enough free pleural space so as to avoid pressure developing in the pleural cavity as pus forms. Since the oil is lighter than pus, the latter may be aspirated as necessary by introducing the needle into the most dependent part of the pleural cavity with the patient in the erect position. The oil acts as a mild irritant and results in thickening of the pleura, which often suffices to control the pleural lesions.

Oil is also used in the pleural cavity when the artificial pneumothorax space is being lost by obliterative adhesions, in order to keep the diseased lung collapsed over a longer period than would be possible by the continued introduction of air. In the occasional case an adequate collapse cannot be obtained by the use of air, and the introduction of oil may suffice. Moreover, a more uniform collapse is maintained with oil.

Oil may also be introduced into the pleural cavity when the patient lives in a remote place and cannot report at sufficiently frequent intervals to the office of a physician who administers artificial pneumothorax treatments. Again, there is the patient who is careless, incorrigible or for some other reason will not maintain the necessary treatment schedule to insure a continued collapse by the use of air. Once a good collapse is instituted, one is justified in gradually filling the pleural space with oil in order that the collapse may be maintained. This not only serves as an aid to the patient but often prevents such persons from infecting others with tubercle bacilli.

For patients receiving artificial pneumothorax whose mediastinum is so labile that it shifts far to the opposite side and thus a good collapse of the diseased area cannot be obtained, one can stabilize the mediastinum by introducing a few cubic centimeters of oil into the pneumothorax space and have the patient lie on the opposite side. The oil will gravitate to the region of the mediastinum and may result in enough irritation to fix the mediastinum.

The only advantage of substituting oil for air in uncomplicated artificial pneumothorax is that the patient does not need to report for refills. In fact, an observation by the physician every two or three months suffices. If pressure develops, a small amount of oil may be removed, or in some cases it may be necessary to add oil occasionally. The duration of oleothorax therapy depends much on the condition at the time it is instituted and the condition of the patient from time to time. If large pulmonary cavities are present when the treatment is begun, the oil may be left in the pleural space indefinitely. If the disease is less extensive, the oil treatment may be discontinued at approximately the same time as one would end artificial pneumothorax treatment. If it was induced for empyema, it may be discontinued when one is reasonably certain that this condition is well controlled.

There are certain disadvantages about the use of oil in the pleural cavity, one of which is that perforations may result either through the chest wall to the surface or into a ramification of a bronchus. Perforations into ramifications of bronchi are not uncommon in ordinary artificial pneumothorax work. They result in bronchopleural fistulas, which may lead to empyema of mixed infection. Therefore it is difficult to state with certainty whether oil in the pleural cavity actually causes this condition. Another disadvantage of oil is that it results in so much thickening of the pleura that it may be impossible for the lung to reexpand after the oil has been removed. A few years ago there was much enthusiasm among physicians for the use of oil in the pleural cavity. More recently, because of greater knowledge of the subject, particularly with reference to the disadvantages, a smaller number of patients are being treated in this manner.

FEVER OF UNKNOWN ORIGIN

To the Editor:—A man aged 30 has irregular attacks of chills and fever that have lasted for three weeks. The temperature is not constant each day, sometimes going to 103 F., sometimes to 99.5; some days there is no fever. His previous history shows that in 1918, while in Mobile, Ala., he had an attack of fever during August while staying in the country and swimming every day in a creek. The fever was high for four days, so high that he was delirious. There were no chills or paroxysmal fever. This fever was experienced the following year under the same conditions but not thereafter, since the family moved to Iowa. In 1931, following a cold five hour ride in the rumble seat of a car one night during which time the man chilled severely, he came down twenty-four hours later with five days of daily paroxysms of chills and fever in the afternoon. At this time the chills were severe for twenty minutes. Then the temperature rose to 104 F. for from two to four hours. Smears for malaria were done during the period of fever; no parasites were found but quinine was given with relief. No subsequent quinine therapy was given following five .30 grain (1.3 Gm.) doses. Later (1932) a careful search for malaria was made of the blood. In 1936 he tells me that he took a course of atabrine at the advice of a friend. What types of fevers infest the coast region that might have caused these childhood fevers? Do any of these become chronic? Is it possible that the fever in 1931 was malaria when the man went home for a visit to Iowa from Tennessee? The five hour night ride was from central Indiana to Nashville, Tenn., and the patient denies any mosquito bites. Is the incubation period for malaria over twenty-four hours? Would a septic tuberculous extrapulmonary abscess cause the present condition of fever? He has lost 40 pounds (18 Kg.) and the Mantoux reaction is + + +. I realize that this information is much abridged, but I will appreciate it if you can help me with these questions and add any suggestions.

M.D., California.

ANSWER.—There is no febrile disease that is peculiar to the southern coastal region of this country. It is true that malaria is more common in the southern part of the United States, but owing to improved methods and greater speed of transportation the northern part of this country is rapidly becoming better acquainted with the so-called tropical diseases. Short bouts of fever of undetermined origin are relatively common in children. As a result of swimming in polluted water, throat and ear infections are the most common causes for such fevers.

If this patient had malaria in 1931 it was not the result of inoculation during the preceding twenty-four hours. This does not eliminate the possibility of malaria. He may have been inoculated with the malarial parasite at some previous time and the clinical symptoms appeared coincidentally with the automobile trip only by chance.

An intelligent guess as to the diagnosis cannot be hazarded in this case because of the paucity of information. This is a 30 year old man who has had fever with chills for the past three weeks, has lost 40 pounds and has a positive Mantoux reaction. Extrapulmonary tuberculosis (and pulmonary tuberculosis) is a possibility but cannot be decided on the evidence of

a positive Mantoux reaction. The problem is one of determining the cause of a long continued fever. Since no physical observations or laboratory reports are given, the field is a rather large one.

A study of the blood is indicated. Leukemia, infectious mononucleosis or some other blood disease is a possibility. Blood cultures and other observations should be made to settle the question of subacute bacterial endocarditis. Undulant fever should be eliminated. Atypical typhoid is a remote possibility. Abdominal Hodgkin's disease sometimes runs such a course. These conditions may be present with a minimum of outward physical signs, and there are a host of others that might be indicated by any of a number of physical signs.

For references to extrapulmonary tuberculosis, the correspondent is referred to a number of textbooks, all of which contain excellent bibliographies. Among such books are:

Goldberg, Benjamin: Clinical Tuberculosis, Philadelphia, F. A. Davis Company, 1935.
Pottenger, F. M.: Tuberculosis in the Child and in the Adult, St. Louis, C. V. Mosby Company, 1934.
Fishberg, Maurice: Pulmonary Tuberculosis, Philadelphia, Lea & Febiger, 1932.

CORONARY DISEASE AND ALTITUDE

To the *Editor*:—Please inform me as to the advisability of allowing a man aged 50, who had a moderate attack of coronary thrombosis eighteen months ago, to take his vacation at Lake George, N. Y. The patient is able to carry on his dental practice. He has never had signs of circulatory failure, is free from anginal pains and is apparently in good health, with a pulse rate of from 70 to 80 a minute. The blood pressure is 110-120 systolic, 80-85 diastolic. Is there any scientific evidence that persons with moderate coronary sclerosis must remain at sea level?

Julius Cogan, M.D., Brooklyn.

ANSWER.—There is no reason why this patient should not take his vacation at any moderate altitude, especially since he is free from symptoms. Altitudes up to 10,000 or 12,000 feet are safe for persons who have had coronary disease including thrombosis provided there are no symptoms at the time, and, even if there are symptoms, on condition that these persons avoid climbing steep grades such as are common at higher altitudes. Many persons feel better in the clear air of hills at from 1,000 to 2,000 feet than they do in the moist air at sea level, whether there is heart disease or not. The heart disease and heart symptoms of such a person may actually be benefited by such a change, since the altitude in itself has no deleterious effect.

ANILINE DERMATITIS

To the *Editor*:—The company for which I am plant physician is using a small percentage of para-nitrosodimethylaniline as an accelerator in one of its rubber compounds. I am unable to discover in any books available to me whether or not this aniline derivative is toxic and if so in what percentages it is dangerous. I found this statement in "Chemistry and Technology of Rubber" (Davis, C. C., and Blake, J. T. Reinhold, 1937, p. 875): "During vulcanization, para-nitrosodimethylaniline yields some para-aminodimethylaniline. . . ." I have further learned that the actual chemical process of an accelerator in rubber vulcanization is not known, although it is supposed that there is an activation of the chemistry involving the sulfur radical in the process. While all workmen handling this material have been closely watched, we have found no evidence of aniline toxicity. However, we have noted a yellow discoloration of the skin of the hands which is not removed by soap and water. I should appreciate your assistance in sending me references that I can find in the Cleveland medical library or, if possible, reprints covering this subject.

M.D., Ohio.

ANSWER.—Para-nitrosodimethylaniline may be accepted as a rubber accelerator which has produced dermatitis among exposed rubber workers. This substance is not a new addition to the long list of accelerators but was used at least as early as 1917. Prosser White (Occupational Affections of the Skin, ed. 4, London, H. K. Lewis & Co., Ltd., 1934, p. 253) states: "Severe cutaneous inflammations, increasing in severity according to length of exposure, are due to para-nitrosodimethylaniline. This substance often goes by the name of 'accelerine.'" Shepard and Krall (Poisons in the Rubber Industry, *J. Indust. Hyg.* **2**:33 [May] 1920) note that in 1917 the rubber section of the American Chemical Society requested a committee on organic accelerators to investigate the toxic properties of a group of such substances, including para-nitrosodimethylaniline. This report is published in the *Journal of Industrial and Engineering Chemistry* (**10**:865, 1918) and in the *India Rubber World* (**59**:82, 1918). Prosser White cites Bridge in connection with para-aminodimethylaniline and states: "This has caused dermatitis in hardeners and steamers in a 'hard felt sheeting' department." In 1927 Quinby (*J. Indust. Hyg.* **8**:102) refers to para-nitrosodimethylaniline as a source of severe inflammation of the skin. Schwartz (Pub. Health Bull. 215, October 1934) reviews the literature referable to dermatitis in the rubber industry and includes several references to para-nitrosodimethylaniline. He mentions the work of Healy (*Nat. Safety Council Tr.* **2**:783, 1929) and Davis (*Rubber Age* **25**:199, 1929). A later article (*Rubber Age* **29**:367, 1931) furnishes the best information now available. He states: "Para-nitrosodimethylaniline is a very toxic substance. During its incorporation with rubber it comes in contact with hydrogen sulfide and is reduced to paraminodimethylaniline, giving the following toxic radicals: amido, nitroso and aniline. Chief effects are dermatitis, stubborn sores, nose and throat irritation, gastrointestinal irritation, nephritis, toxic anemia with blood cell pathology. However, the material is used in such small quantities that there is no danger if men wear gloves to prevent the material from coming in contact with the skin. The material is usually used in a paste form."

FATIGUE, AMINOACETIC ACID AND GELATIN

To the *Editor*:—1. A married woman, aged 26, has had no illness except a mild case of influenza in February of this year. The urine is normal; the white and red blood cell count is within normal limits, with no abnormal cells but with hemoglobin for the past five months ranging between 70 and 76 per cent even though she has been taking some iron. The tuberculin reaction is negative and she complains of slight fatigue and an occasional temperature of as much as 99.4 F., but this is not constant. Do you suggest any treatment; if so, what? Do you think that the hemoglobin is too low? Any suggestions with regard to treatment or therapy will be appreciated by me. 2. In The Journal July 8 I read with a great deal of interest the article on Knox Sparkling Gelatine, put up in Johnstown, N. Y. For some time I have been advising the taking of the contents of from two to four of the small envelops that come in a package stirred into a glass of cool water. This amount each day was advised for from two to four weeks for patients showing fatigue. I note that this product is not now acceptable but I know that it had been on the accepted list. Do you think that the product could produce any harm or have any bad effects on the patient if it is merely stirred into the water and drunk that way? Even though it does not help fatigue, do you consider it harmful in any way to the patient? I know that aminoacetic acid with vitamin B_1 is recommended in fatigue; am I right in this? If so, what dosage and what preparation would you advise? Is it harmless?

M.D., Alabama.

ANSWER.—1. It would seem that the patient described is enjoying fairly good health. A hemoglobin content of from 70 to 75 per cent is not usually considered entirely satisfactory and may be enough to account for the occasional fatigue. Unless there is some cause for the anemia apart from iron deficiency, the low hemoglobin may be overcome by liberal iron therapy. An occasional temperature of 99.4 F. may or may not be significant. It is less significant in a person who is up and about than in one who is kept at rest. Such temperatures are found to be normal for certain persons. A careful search should reveal the significance of the elevation of temperature in this case.

2. The amino acids have long been used in certain instances of muscular weakness. Probably the most potent of these is aminoacetic acid, which forms the basis of numerous preparations. In certain types of myasthenia the use of one of these preparations has been thought to be helpful. The dose is relatively high and the preparations are rather expensive. It has been urged that gelatin may have a beneficial effect in muscular fatigue and muscular weakness but insufficient evidence bolsters up these claims. The critical observer is far from convinced. While no harm can come from the moderate use of gelatin, neither can any startling results be expected. The same may be said for vitamin B_1 and the other amino acid preparations. It would seem wiser to attempt to fathom the cause of the fatigue than to present the patient with crutches in the way of amino acid preparations.

TREATMENT OF GRANULOMA VENEREUM

To the *Editor*:—I am anxious to know a good treatment for granuloma inguinale. Can you give me some information on satisfactory treatment for this disease?

W. M. Cason, M.D., Sandersville, Ga.

ANSWER.—Granuloma inguinale, better known as granuloma venercum, is caused by the Donovan bodies. Their true nature is not yet known. This disease is seen almost entirely in Negroes and is most rebellious to treatment. Unless therapy is kept up until long after the clinical manifestations have cleared up there is a tendency for it to relapse. One of the first requisites with the disease is prophylaxis and prevention of spread to others. Cleanliness is also in order, since there is often a secondary Vincent's infection superimposed on the granuloma venereum. For example, potassium permanganate 1:4,000 in the form of sitz baths twice a day is useful. Soap and water are also indicated. Preparations of antimony seem to give the best results in the treatment of this disease, par-

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ticularly fuadin. Treatment is given by intramuscular injection, starting with a dose of 1.5 cc. the first day, 3.5 cc. the second day and 5 cc. the third day, changing buttocks at each injection. After the first three doses are given five or six additional doses may be administered two or three days apart. After a total of some 40 cc. of the fuadin has been given, it is well to discontinue treatment for a week or so. The urine should be watched closely for evidence of irritation of the kidneys. If there is no irritation, a succeeding series of injections may be employed. It is necessary, however, that therapy be used after all clinical manifestations have disappeared, for in many of these cases biopsy made from the affected areas, even after they are apparently well, may still show the Donovan bodies in the tissue. As a rule no effect other than occasional irritation of the kidneys is noted with this preparation. Now and then there may be some headache or nausea, rarely some complaint of joint pain, transitory in character. Permanent cure of granuloma venereum requires expert care and much patience on the part of both patient and physician.

CHILLS AND FEVER

To the *Editor*:—I was called recently to see a man aged 35 who is a stationary engineer. The symptoms of which he complained extend back over a period of fourteen years. During these years he has spent a lot of money going through clinics, but the answer has always been that he has no organic disease. The spells of which he complains come out of a clear sky. There is usually a chill, sometimes severe, lasting from three to four hours. He has a slight headache at these times. The temperature is always up to 101 F., sometimes 101.4. The pulse is accelerated to 120 or 130. The legs ache. These spells last about twenty-four hours, after which he is apparently back to normal again. With these spells he has what he describes as acute indigestion, with symptoms more or less severe. The spells are gradually getting worse. There is a bowel movement every day but there is a tendency to constipation. He takes sodium bicarbonate or the "patent medicines" that are on the market for this purpose. I have not had an opportunity of doing any laboratory work on this patient. I suppose that all the laboratory work indicated has been done in the clinics he has visited. Besides chronic cholecystitis, what other possibilities should be considered?
M.D., Minnesota.

ANSWER.—It would, of course, be necessary to obtain the complete reports of the examinations in the various clinics visited by the patient and to learn whether the patient has ever been accurately studied during one of his "spells." Nothing is said as to what the patient means by "acute indigestion." An illness lasting only twenty-four hours is seldom observed by a physician in time to make the necessary observations. If the studies made elsewhere have been complete and have thus far not revealed any organic disease, a different line of diagnostic attack must be pursued. One is at a loss to suggest what infection could cause illness, such as that described, over a period of fourteen years without disappearing in time or getting much worse.

The severe chill, relatively high fever, intestinal symptoms and suddenness of the onset and recovery suggest an allergic type of reaction rather than the so-called psychogenic fever. A careful study should be made to test the patient for possible sensitivity to many substances with which he may come in contact in his work, diet, pastime and so on. Does the illness usually start at one time of the day or another? Are there any psychic or other underlying factors in the case? Not until such studies have been made can a decision be reached. It is unlikely that the patient has chronic cholecystitis.

TURBINATE SHRINKING

To the *Editor*:—Please let me know what success has been had with turbinate shrinkage with sclerosing solutions and what solution seems to give best results.
J. B. H. Waring, M. D., Wilmington, Ohio.

ANSWER.—Various solutions have been used in the nose with the idea of shrinking the turbinates. Among these have been a 20 per cent solution of sodium chloride, a 50 per cent solution of dextrose and a 20 per cent solution of sodium salicylate. Quinine hydrochloride and ethyl carbamate have been used as well as quinine lactate. Lafayette P. Monson (Treatment of the Hypertrophied Inferior Turbinate by Use of Sclerosing Solutions, *Arch. Otolaryng.* **22**:96 [July] 1935) has used the latter and claims to get good results. Others, among them H. H. Vail (Treatment of Hay Fever by Nasal Injections of Alcohol, *ibid.* **18**:651 [Nov.] 1933), have used alcohol in various concentrations and have reported a similarly beneficial outcome.

A 5 per cent sodium psylliate solution has, in addition, recently been recommended, one claimed advantage for it being that no anesthetic is required as is the case with alcohol, in which procaine is frequently added to the mixture.

It is difficult to say which solution gives the best results. None of them work perfectly and all have their advocates. The important thing is that the medications used be safe and not produce deleterious reactions, such as undue pain, swelling and sloughing. For this reason a 40 to 60 per cent ethyl alcohol solution is probably as good as any.

STERILIZATION OF DISHES

To the *Editor*:—Can you give me any information as to the sterilization efficiency for dishes, drinking glasses and silverware of F. D. A. phenol coefficient 2.25, formula K. P. 100, a bactericidal detergent made by the Pioneer Manufacturing Company, Cleveland? If not, can you can tell me what product you recommend for sterilizing a patient's dishes other than by boiling?
Jeanette F. Thomas, Hospital Superintendent, North Conway, N. H.

ANSWER.—Sterilization of utensils by chemical agents involves not only employment of solutions that are actually germicidal but also adequate contact between germicide and bacteria. The latter is the more difficult phase of the problem. Literally countless chemical agents have been recommended and are on the market that under ideal laboratory conditions are able to kill suspensions of test bacteria as well as, or better than, a standard solution of phenol. But it does not follow that similar results are obtained on contaminated tableware, where many of the pathogenic organisms are protected by insoluble materials such as grease, the remains of food, coagulum and dried mucus. Attempts to solve the problem by adding detergents to bactericidal solutions have not, on the whole, proved successful. Washing the dishes clean before applying the germicide is not feasible, since that involves handling the contaminated objects and almost uncontrollable dissemination of the very organisms that it is desired to destroy.

The "bactericidal detergent" referred to in the inquiry is "K. P." (Kitchen Police), said by the manufacturers to be a derivative of their product "K. O." (Kills Odor) plus a detergent powder. The chemical nature of these products is not divulged. "K. O." in 1:192 solution is alleged to have a phenol coefficient of 2.25, but in advertising emphasis is laid chiefly on its deodorant properties. No acceptable evidence that "K. P." is an effective disinfectant for contaminated utensils has been found.

Sterilization of contaminated dishes, drinking glasses and silverware by boiling water or live steam is simple, rapid, inexpensive and absolutely certain. That is more than can be said for any method of chemical disinfection known at present.

SUDDEN LOSS OF BLOOD

To the *Editor*:—Do you think it possible for a man aged 43, 5 feet 7 inches (170 cm.) tall, weighing 175 pounds (79.4 Kg.), to lose 3 quarts of blood within a period of three or four hours and survive? Is it probable that blood taken from his ear twenty-four hours later would show only a small decrease in red cells?
M.D., Texas.

ANSWER.—A definite reply to the question is difficult without more specific information about the circumstances of the loss as well as the state of health of the patient. Such a man as described would probably have about 7 quarts of blood. It is usually considered that a man cannot survive loss of more than 40 per cent of the total blood volume without prompt treatment. Survival in the case cited is not impossible but it is extremely improbable. The blood picture at twenty-four hours would depend on the method of loss, the rate of loss, the water intake and output and the sensitivity of the vasomotor system, all of which are unpredictable. General experience, however, would justify the prediction that a definite reduction in the red blood cell count would persist for several days or even weeks.

SULFANILAMIDE AND IRON THERAPY

To the *Editor*:—A patient with an acute case of trachoma of the eyes is receiving copper sulfate from 1.5 to 2 per cent in glycerin locally in the eyes and one-third grain (0.02 Gm.) of sulfanilamide per pound of body weight with equal amounts of sodium bicarbonate daily. The last laboratory report showed that she had 3,420,000 red blood cells and a hemoglobin content of 74 per cent. At this time the question came up of giving her some iron preparation. Would there be any contraindication to such iron therapy concurrently with sulfanilamide medication? I have been unable to find anything in the literature. I wonder whether you could advise me?
Max W. Jacobs, M.D., St. Louis.

ANSWER.—Concurrent iron therapy in a patient who is receiving sulfanilamide is not contraindicated if the patient is anemic. As a general rule anemias do not respond well to iron therapy until the underlying infection is brought under control by sulfanilamide therapy.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, September 16, page 1154.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. *Oral.* Part II. Philadelphia, Oct. 14-15. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* Philadelphia, Nov. 3-4. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various sections of the United States, Feb. 19. Formal application must be received on or before Jan. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written examination and review of case histories (Part I) for Group B candidates* will be held in various cities of the United States and Canada, Jan. 6. *Applications for admission to Group B, Part I, examinations must be on file not later than Oct. 4. General oral and pathological examinations (Part II) for all candidates (Groups A and B)* will be conducted in Atlantic City, N. J., June 8-11. *Applications for admission to Group A, Part II examinations must be on file not later than March 15.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Written. Various cities of the United States and Canada, March 9. Oral. New York, June 10. *Formal applications must be received before Jan. 1.* Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Boston, January. *Applications must be filed on or before Nov. 1.* Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 6-7. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PATHOLOGY: Memphis, Nov. 22-23. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: New York, April 30 and May 1. Kansas City, Mo., preceding the Region III meeting of the American Academy of Pediatrics. Seattle, June 2. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, December. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Atlanta, Ga., Dec. 9-11. Sec., Dr. Byrl R. Kirklin, 102-110 Second Avenue S.W., Rochester, Minnesota.

AMERICAN BOARD OF UROLOGY: Chicago, Feb. 9-11. (The only examination session to be held in 1940.) *Case reports must be submitted not later than November 9.* Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Florida June Examination

Dr. William M. Rowlett, secretary, State Board of Medical Examiners of Florida, reports the examination held at Jacksonville, June 19-20, 1939. One hundred and sixty-seven candidates were examined, 143 of whom passed and twenty-four failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Arkansas School of Medicine		(1938, 3)	3
College of Medical Evangelists		(1937)	1
George Washington University School of Medicine		(1935), (1939)	2
Howard University College of Medicine		(1933)	1
Atlanta Medical College		(1914)	1
Emory University School of Medicine		(1923), (1933), (1936, 2), (1938, 2), (1939, 15)	21
University of Georgia School of Medicine		(1934), (1938), (1939, 3)	5
Loyola University School of Medicine		(1917), (1935), (1938)	3
Northwestern University Medical School		(1921), (1938), (1939)	3
Rush Medical College		(1937)	1
School of Medicine of the Division of the Biological Sciences		(1934)	1
University of Illinois College of Medicine		(1936)	1
Indiana University School of Medicine		(1925)	1
State University of Iowa College of Medicine		(1930)	1
University of Louisville School of Medicine		(1924), (1927), (1934)	3
Tulane University of Louisiana School of Medicine		(1937), (1938, 2), (1939, 11)	14
Johns Hopkins University School of Medicine		(1913), (1928), (1929), (1935)	4
University of Maryland School of Medicine and College of Physicians and Surgeons		(1932), (1936), (1939)	3
Harvard Medical School		(1918), (1920), 1933	3
Tufts College Medical School		(1928), (1939)	2
University of Michigan Medical School		(1925)	1
St. Louis University School of Medicine		(1936), (1939, 2)	3
Washington University School of Medicine		(1939)	1
Columbia University College of Physicians and Surgeons		(1908), (1910), (1918), (1935)	4
New York Medical College and Flower Hospital		(1937)	1
New York University College of Medicine		(1936), (1938)	2
University and Bellevue Hospital Medical College		(1908), (1932)	2
University of Buffalo School of Medicine		(1937)	1
Duke University School of Medicine		(1936, 2) (1939, 4)	6
North Carolina Medical College		(1911)	1
Eclectic Medical College, Cincinnati		(1939)	1
Ohio State University College of Medicine		(1925), (1937)	2
University of Cincinnati College of Medicine		(1934), (1936), (1937), (1939)	4
Western Reserve University School of Medicine		(1938)	1
University of Oklahoma School of Medicine		(1936)	1
Hahnemann Medical College and Hospital of Philadelphia		(1938)	1
Jefferson Medical College of Philadelphia		(1929), (1938), (1939)	3
Temple University School of Medicine		(1913), (1937, 2), (1939)	4
University of Pennsylvania School of Medicine		(1921, 2), (1925), (1926), (1933), (1934), (1939)	7
University of Pittsburgh School of Medicine		(1930)	1
Medical College of the State of South Carolina		(1935), (1936), (1938)	3
Meharry Medical College		(1939)	1
University of Nashville Medical Department		(1908)	1
University of Tennessee College of Medicine		(1938), (1939, 5)	6
Vanderbilt University School of Medicine		(1937), (1939)	2
Baylor University College of Medicine		(1936), (1938)	2
University of Texas School of Medicine		(1937)	1
Medical College of Virginia		(1930), (1938)	2
University of Virginia Department of Medicine		(1932), (1936)	2
University of Western Ontario Medical School		(1938)	1
McGill University Faculty of Medicine		(1927)	1

School	FAILED	Year Grad.	Number Failed
University of Alabama School of Medicine		(1914)	1
Georgetown University School of Medicine		(1935)	1
Atlanta Medical College		(1915)	1
Emory University School of Medicine		(1939)	1
University of Georgia School of Medicine		(1936), (1938)	2
College of Physicians and Surgeons of Chicago		(1912)	1
School of Medicine of the Division of the Biological Sciences		(1936)	1
Tulane University of Louisiana School of Medicine		(1937)	1
Johns Hopkins University School of Medicine		(1926)	1
Harvard Medical School		(1917)	1
Washington University School of Medicine		(1918)	1
Albany Medical College		(1934)	1
University and Bellevue Hospital Medical College		(1928)	1
University of Buffalo School of Medicine		(1932)	1
Jefferson Medical College of Philadelphia		(1933)	1
University of Pennsylvania School of Medicine		(1930)	1
Medical College of the State of South Carolina		(1929)	1
University of Tennessee College of Medicine		(1930)	1
Medical College of Virginia		(1924)	1
University of Virginia Department of Medicine		(1937)	1
Marquette University School of Medicine		(1916)	1
Wisconsin College of Physicians and Surgeons		(1901)	1
University of Toronto Faculty of Medicine		(1912)	1

Nebraska June Examination

Mrs. Clark Perkins, director, Bureau of Examining Boards, reports the written examination held at Omaha, June 8-9, 1939. Seventy-seven candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Creighton University School of Medicine		(1938, 2), (1939, 14)	16
University of Nebraska College of Medicine		(1937), (1938, 3), (1939, 57)	61

Six physicians were licensed by reciprocity and one physician was licensed by endorsement from January 30 through June 5. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1936)	Colorado
Northwestern University Medical School		(1929)	Kansas, (1935) Iowa
State University of Iowa College of Medicine		(1936)	Iowa
University of Kansas School of Medicine		(1937)	Kansas
Washington University School of Medicine		(1937)	Missouri

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Nebraska College of Medicine		(1932)	N. B. M. Ex.

South Dakota July Report

Dr. G. J. Van Heuvelen, director, Medical Licensure, reports the written examination held by the South Dakota State Board of Medical Examiners at Rapid City, July 18-19, 1939. The examination covered thirteen subjects and included 100 questions. An average of 75 per cent was required to pass. Eleven candidates were examined, all of whom passed. One physician was licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Loyola University School of Medicine		(1926)	83.8
Northwestern University Medical School		(1938) 89.6, (1939)	85.6
Rush Medical College		(1934) 80.4, (1937)	90.3
University of Minnesota Medical School		(1938) 81.7, (1939)	89.6*
Creighton University School of Medicine		(1935) 83.7, (1938)	82.5
University of Nebraska College of Medicine		(1938)	83.4
Marquette University School of Medicine		(1939)	84.8

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
State University of Iowa College of Medicine		(1928)	Montana

* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship.

Book Notices

Marihuana, America's New Drug Problem: A Sociologic Question with its Basic Explanation Dependent on Biologic and Medical Principles. By Robert P. Walton, Professor of Pharmacology, School of Medicine, University of Mississippi, University. With a foreword by E. M. K. Geiling, Professor of Pharmacology, University of Chicago, and a Chapter by Frank R. Gomila, Commissioner of Public Safety, New Orleans, and M. C. Gomila Lambou, Assistant City Chemist. Cloth. Price, $3. Pp. 223, with 17 illustrations. Philadelphia, Chicago, New York, Montreal & London: J. B. Lippincott Company, 1938.

This book has served to bring together a large body of information on Indian hemp. Much of the material represents a concise interpretation of the present bibliography on the subject. The author reviews the history of the misuse of hashish and concludes that this "vice" has flourished conspicuously in many countries for the last thousand years. He points out that during the fourteenth century officials were making desperate but unsuccessful efforts to eradicate the practice and that later in the nineteenth century Napoleon's generals used forceful methods in an attempt to curb the vice, which was then considered pernicious. The author believes that these restrictions were temporarily successful and that the practice has continued at the present time with no particular prospect of being exterminated. The history of the misuse of hemp in other countries tends to support the view that the American misuse will not be speedily eradicated. The book reviews the distribution of the hashish vice from the world standpoint, and the present status of its misuse in the United States is also considered. The latter represents largely a compilation of articles from the public press. The authors of that section, however, mention that serious minded observers have found it difficult to express the real extent and gravity of the situation and that there has been no especially systematic attempt to estimate the current distribution of the misuse of marihuana. Newspaper reporters and magazine feature writers have probably given more active attention to the matter of dramatizing the situation. Although a serious attempt is made to review the present status of knowledge with reference to its distribution in the United States, nevertheless much of the information is not based on scientific inquiry as to where, when and under what conditions such a vice flourishes. The source of the plant is discussed; the technic of its misuse; the experiences of its use are described; the acute and chronic effects are mentioned; the therapeutic application of cannabis is discussed, and the pharmaceutic and chemical action are also briefly reviewed, together with a determination of physiologic activity. The book contains a complete nomenclature of words equivalent for the hemp plant or the crude drug as they are applied to different parts of the world, and also a rather exhaustive bibliography on the subject. On the whole, the book represents a rather satisfying clerical compilation but adds nothing especially new in the field. It will serve as a valuable reference.

La coca: Estudio medico-social de la gran toxicomania peruana. Por Luis N. Saenz. Paper. Pp. 235. Lima: Imp. de la E. de la G. C. y P., 1938.

The author presents a thorough study concerning the uses, abuses and effects of the coca leaf and its derivatives among the population of Peru. The book is divided into three parts. Part I deals with the drug itself. The author describes in detail the role of coca leaves in the routine life of the Peruvian native from historical, medicinal, occupational and economic aspects. The relationship of the coca leaf and its derivatives to cocaine addiction is explained. He presents fairly the various important concepts concerning addiction to the coca leaf and the drugs derived from it. Part II deals chiefly with the addiction through the coca leaf and the effect that it has on the individual physically and mentally and, in a broad aspect, socially. Interesting results of studies concerning habit and abstinence in the coca leaf user and also studies of the action of the drug are presented. Part III concerns recommendations for the treatment of coca leaf users in Peru. The author advocates social and legislative measures regarding the undesirable effects of drug addiction. For this purpose he employs the aid of the educational system, philanthropic enterprises, patriotic citizens and the medical and legal professions. He advocates the daily use of radio programs for the dispersing of educational propaganda concerning the ravages of addiction to drugs, particularly the coca leaf. He feels that drug addiction is a problem of national concern and advocates that the state subsidize agriculture so that employers may pay for services rendered entirely in money instead of part money and part coca leaf as is the custom in many districts in the mountain regions of Peru. It is believed that in this book Saenz has presented the problem of addiction to the use of the coca leaf in Peru in its true light, i. e. one of sociological, medical and economic importance. His analysis of the situation is thorough and his remedial suggestions are meritorious and of international interest.

Anemia in Practice: Pernicious Anemia. By William P. Murphy, A.B., M.D., Associate in Medicine, Harvard Medical School, Boston. Cloth. Price, $5. Pp. 344, with 46 illustrations. Philadelphia & London: W. B. Saunders Company, 1939.

This volume represents a detailed discussion of the clinical investigations of pernicious anemia in which the author has participated during the past fifteen years. The importance of treatment in the presence of complications, particularly the neurologic, is stressed and well presented. A briefer and somewhat less comprehensive presentation of certain of the other anemic states is included, apparently for the sake of completeness. The use of liver extract in the treatment of the hemolytic anemias would seem to be somewhat uncritically and overenthusiastically advocated in the light of the published experience from other clinics and on the basis of the known difference in the pathologic changes in the bone marrow in pernicious anemia (megaloblastic hyperplasia) and in hemolytic jaundice (normoblastic hyperplasia) and of the knowledge of the point in the erythrocyte maturation cycle at which the erythrocyte maturation factor is effective. The treatise has been written by the author that "the facts may be conveniently available for practical application" and that they may "be read with pleasure by the physician, and benefit not only him but his patient as well." The last two chapters deal with the more essential routine laboratory procedures in hematologic diagnosis and a brief reference to blood transfusion.

Die Zuckerkrankheit: Leitfaden für Studierende und Ärzte. Von Prof. Dr. Ferdinand Bertram, leitender Arzt der II. medizinischen Abteilung des allgemeinen Krankenhauses Barmbeck, Hamburg. Second edition. Paper. Price, 6 marks. Pp. 123, with 17 illustrations. Leipzig: Georg Thieme, 1939.

Bertram's book has been revised five years after its first appearance to include the aspects of diabetes which have changed in the interval, especially those which deal with the pathogenesis of the disease and certain questions in therapy. He emphasizes the importance of the influence of the anterior pituitary lobe as an organ effective in the regulation of blood sugar and reviews the investigations of Houssay, Young and Best. The experiments of these authors are believed to confirm the conception that a hormone antagonistic to insulin is produced by the anterior pituitary lobe.

In the section on clinical diabetes Bertram defines diabetes as a chronic disease of the total neuro-endocrine apparatus with a hypofunction of the pancreas in the foreground. A disturbance in the anterior pituitary lobe is etiologically responsible for some cases of diabetes, if not for all. In the etiology he shares the unitarian point of view, already represented by Naunyn, that all cases of diabetes have a constitutional hereditary background, a congenital minus variation of the endocrine system. Bertram considers certain exogenic factors, especially nutritional changes, responsible for the great increase of diabetes observed in all civilized countries. He calls diabetes an outspoken disease of civilization. The chapter dealing with the increase of diabetes is especially worth while. In a classification of the severity of diabetes he distinguishes mild cases as being those in which with sufficient diet (at least 150 Gm. of carbohydrate) and without insulin ketosis does not develop, moderately severe cases as those in which adequate diet alone does not control ketosis but insulin is required, and severe cases as those in which, in spite of adequate diet and insulin, ketosis is present.

In the section dealing with complications of diabetes, neuritis is explained on the basis of a hypovitaminosis due to a deficiency of vitamin B_1. Diabetic neuritis, however, is believed to be

very resistant to B_1 therapy. He considers that the high incidence of vascular disease is to be expected on the basis of the present increase of longevity in diabetes. According to Bertram there is no doubt that the cause of the frequent incidence of vascular disease in diabetes is the excess of fat in the diet.

In a discussion of pregnancy in diabetes he emphasizes the high mortality of children of diabetic mothers and states that in his experience the fetal mortality was 50 per cent. He attributes the gigantism in the child to lack of control of maternal diabetes and believes that it can be prevented by sufficient control of hyperglycemia. He believes that the blood sugar of the mother should be kept low in the last month of pregnancy. He recommends cesarean section in suspected eclampsia or in any instance of deterioration of the metabolic situation. He divides coma into three classes, dyspneic, cardiovascular and renal. The section on pseudo diabetic peritonitis is very good.

The second part of the book is concerned with the treatment of the disease. Bertram represents the modern school using relatively high carbohydrate diets. His principles are that the diet should be rich in carbohydrate and poor in fat and should contain a moderate amount of protein. Although the diets are exactly calculated and balanced, he thinks that precise prescriptions are to be avoided. The diabetic patients must not use scales. He does not recommend qualitative analysis of the urine by the patient. The best measure of the management of the diabetes is the subjective well being of the patient. He recommends a simple diet to avoid overnutrition. In his discussion of the insulin management of diabetes, Bertram describes the historical development of protamine, reviewing his own first attempts to increase and prolong the action of insulin by the addition of various proteins. Results with protamine insulin are believed to be good in the majority of cases. He employs one injection in twenty-four hours. Complete failure occurred in only three cases. In severe cases of diabetes he recommends two injections of protamine.

In the treatment of coma he recommends dextrose, which he believes to be more important than insulin. For every 3 Gm. of carbohydrate, 1 unit of insulin is given. In incessant vomiting and impending uremia, large quantities of sodium chloride are given in hypertonic solution (from 20 to 50 cc. of 10 per cent saline solution). In cases of extreme acidosis, alkalis are employed. He uses a 4 per cent solution of sodium bicarbonate. Diabetes in childhood is briefly discussed and he reemphasizes the point that all diabetic children should be treated with insulin. This excellent monograph is highly recommended to all interested in diabetes.

Angina Pectoris: Nerve Pathways, Physiology, Symptomatology, and Treatment. By Hayman B. Miller, M.D., Attending Physician, Sydenham Hospital, New York. Cloth. Price, $3.25. Pp. 275, with 39 illustrations. Baltimore: William Wood & Company, 1939.

As the author himself asks in the first line of his preface, Why another book on cardiac pain or angina pectoris? His answer is: "There is no dearth of books in this field and yet even after 150 years or more of study of this malady or syndrome the fundamental problems remain unsolved. This volume makes no claim to the solution of these vital questions but is an attempt to restate and to analyze them anew in the light of our present day knowledge. To this end a cardinal prerequisite is a clear understanding of the pathways that initiate, transmit and deliver cardiac pain into consciousness. As a matter of interest, this little volume grew out of an original desire to present a series of carefully drawn anatomical charts of the cardiac innervation and this desire, I believe, has been fulfilled. It was realized, however, that a mere delineation of the pathways with no descriptive text of their known physiology would be intelligible only to the research specialist in this field. To make the drawings available to a larger group, the text was developed to implement the drawings and to include as much of the clinical aspects as was needed for a rather comprehensive presentation of the subject."

These anatomic charts are interesting, helpful, and well done, though a few are so simplified that they seem superfluous. One may especially recommend the study of figures 30 and 31 on pages 96 and 97, which give front and side views of the sympathetic and vagal cardiac innervation, and figures 37 and 38 on pages 135 and 137, giving the pathways for referred pain for the gallbladder into the cardiac territory and vice versa, the former two summarizing the previous diagrams, and the latter two helping to explain the distribution and reference of pain. In the discussion of the paroxysm of angina pectoris in itself the author emphasizes the possible nervous manifestations: "A paroxysm of angina pectoris, we believe, is an expression of a paroxysmal upheaval of the entire autonomic system with manifestations that are characteristic of each of its divisions, each limb acting as if its central nucleus were set off. We shall call attention especially to the unitary mass action and mutuality of these divisions rather than to their apparent antagonisms." This description, however, is an exaggerated account of the usual attack of angina pectoris. In the first sentence just quoted "is" should better be "may be," since often a paroxysm of angina pectoris has no other manifestations related to it. The most useful parts of the volume are the description of the cardio-aortic nerve connections and the transmission, distribution and simulation of anginal pain, to be found in sections 2 and 3; treatment might to advantage have been omitted, just as many other aspects of angina pectoris have been wisely omitted from this type of book. The diagrams should prove helpful to the student and physician who are not yet familiar with the recent advances in this subject.

Veröffentlichungen aus der Konstitutions- und Wehrpathologie. Herausgegeben von L. Aschoff, W. Coelen, W. Koch und P. Schürmann. Gelettet von W. Koch. Heft 45. Band X, Heft 1: Über die menschlichen sireniformen Missbildungen. Von Günter Friedrich. Paper. Price, 6 marks. Pp. 84, with 48 illustrations. Jena: Gustav Fischer, 1938.

This small paper-covered monograph is a careful study of a rare congenital fetal malformation, the sireniformen fetus (sympodia, sirenomelia) in which there is a complete or partial fusion of the lower limbs. The term sireniformen, which Ballantyne says is less acceptable than sympodia, refers to a fabulous creature, the siren. The author reports twelve specimens which have been collected over a period of years. He has made a careful study of these monstrosities and has catalogued the various deformities. The whole pelvis is malformed in most of the fetuses. The sacral and coccygeal vertebrae may be defective or excessive in number and the tip of the spinal column may be directed backward, to one side or even upward, which may account for the occasional presence of a chordaform projection in the sacral region. The lower limb represents all degrees between complete fusion of the constituent bones, muscles, vessels and nerves and a simple membranous union of the two outwardly rotated limbs. The bladder is usually absent. One artery is almost always present in the umbilical cord. The author carefully describes the absence or presence of the usual anomalies in his collection. For the most part he agrees with the excellent descriptions of these unusual monstrosities already in the literature. No new theory is advanced for their causation. This monograph will be of interest only to students of teratology.

Two Lifetimes in One: How Never to Be Tired; How to Have Energy to Burn. By Marie Beynon Ray. Cloth. Price, $1.96. Pp. 311. Indianapolis & New York: Bobbs-Merrill Company, 1938.

This is a popular presentation for those who are none too sure of their own mental capacities. The desire of Americans to become more efficient in their mental lives has resulted in a plethora of books designed to aid them in developing their efficiency and their ability to meet people, to make a favorable impression and to live more wholesome lives and in every conceivable way to make them "successful" citizens. Since, after all, the root of most maladjustment is in childhood and the way the individuals are trained, as well as in their later economic opportunities, clinic help can seldom be supplanted by a book unless it is miraculously therapeutic; and there is nothing about the present volume that makes it worthy of note except that it is highly readable. It contains examples of individuals who have made use of their time in a more efficient manner or who have changed their attitudes so that they were able to do more work than some one who seemingly becomes too easily fatigued. Innumerable cases are cited and there is quite a bit of reference in a superficial and nonmedical way to the literature of fatigue, psychology and psychiatry. The writer seems to know several psychologists and psychiatrists quite well, but some of those

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whom she quotes are rather esoteric and perhaps even exotic, so that the advice which she quotes from them probably would not be sustained by most of their colleagues. Marie Ray's is one of the least harmful books of its kind that have been produced. There is no attempt to cause the individual to make a radical change in his personality but rather to reorganize his way of approaching his problems, particularly those which result in fatigue and slow down the effectiveness of the reader. The author is a magazine editor who is amusing as well as interesting and the material which she presents, while of dubious therapeutic value, might serve to aid in the adjustment of problem personalities. One must be hesitant in prescribing a book like this in bibliotherapy because of its exuberance, and certainly it is not meant for a mentally afflicted person who needs psychotherapy; but for the rather maladjusted inferior person who might be helped by reading an inspirational volume it might have a value. Some of the material that she presents is likely to be dramatic enough to give the individual at least a temporary "lift" and in this sense it is not harmful and might even be beneficial. It cannot be considered good science.

Clinical Obstetrics. By A. Lakshmanaswami Mudaliar, B.A., M.D., F.C.O.G., Professor of Obstetrics, Madras Medical College, University of Madras, Madras. Cloth. Price, 27s. Pp. 819, with 213 illustrations. Edinburgh & London: Oliver & Boyd, 1938.

The author has had an unusual clinical experience for many years in one of the largest teaching institutions in India and the Near East. This volume, as its title indicates, completely covers normal and abnormal obstetrics. The subjects are treated in a concise and logical manner. Accepted treatment is suggested for the major complications, although constant recognition is given to the fact that such therapy may be impossible to carry out in special circumstances. The author discusses briefly other treatments advocated in large teaching institutions which have been accorded some recognition. The common operative procedures are discussed in detail and are satisfactorily illustrated. One might take exception to some of the therapeutic suggestions. Uterine tamponade in the case of placenta praevia has been almost completely discarded in large teaching clinics. However, the limitations of this method of therapy are carefully noted. The treatment of eclampsia has been simplified in this country. Sedation, diuresis by intravenous administration of hypertonic dextrose solutions and the induction of labor comprise the most important principles in therapy. The use of tincture of veratrum viride to reduce the blood pressure has fallen into complete discard. Labor is usually initiated by simple rupture of the membranes or the use of a small colpeurynter rather than by the use of bougies. The author's treatment of preeclampsia is in keeping with present day therapy. Vaginal cesarean section is favored in many instances, although its popularity in this country has been on the wane. The tropical diseases and their relationship to pregnancy, labor and the puerperium have been thoroughly covered. So little has been written about these subjects that this presentation is a welcome contribution, particularly to that part of the world in which these diseases are so prevalent. The importance of the diagnosis and treatment of the serious anemias of pregnancy common in India and the Near East is likewise properly emphasized.

The Obliquely Contracted Pelvis, Containing also an Appendix of the Most Important Defects of the Female Pelvis. By Dr. Franz Carl Naegele. Centennial edition, newly translated from the original German by Alfred M. Hellman, M.D., F.A.C.S., and George Musa, M.D. Boards. Price, $12. Pp. 69, with 16 plates reproduced in the colors of the original edition of 1839. New York: Pynson Printers Incorporated, 1939.

Franz Carl Naegele published the results of many years of laborious work on the obliquely contracted pelvis in a monograph in 1839, and now this centennial edition appears, a fine translation by Alfred M. Hellman and George Musa of New York. The profession owes a debt of gratitude to these men for undertaking and carrying through this work, because there are few copies of the original book in existence. Now every one interested in the science of obstetrics may study one of its most important building stones, a chapter on contracted pelvis. The basis of Naegele's work on obliquely contracted pelvis lies in the accurate and painstaking study of thirty-five pelves, of which several were of his own discovery but most were brought to his attention by his son and others. Ankylosis of the sacroiliac joints and arrest of the development of one lateral half of the sacrum formed the main characters of this newly discovered deformity, which he called the obliquely contracted pelvis but to which his name is now attached. The author describes some pelves which have a shape and other characters resembling the true deformity, i. e. intermediate degrees of the deformity. He speaks of the influence of the deformity on labor and the difficulty in diagnosis, which he tries to remove by a full description of the method. In an appendix he describes the most important types of deformed female pelvis—the highly rachitic, the osteomalacic and the exostotic pelvis—nowadays almost unknown in practice. The beautiful and instructive illustrations are in the color of the originals. Nowadays a monograph of this kind seems to have only academic and historical interest. Most obstetricians hardly care whether a woman has a classic Naegele pelvis or any other kind of pelvic obstruction. If the head remains high after a few hours of labor, he does a section and lets it go at that. But to the scientific obstetrician a monograph like the present one is a delicious morsel, and if he should happen on a real Naegele pelvis in his practice he would be able to show the real skill that is in him. Unlike modern medical literature, with its stark science, Naegele's work shows a warm and human light touch. He emphasizes the teacher-pupil relation and exhibits profound gratitude to those who have helped him assemble and investigate rare and difficult material. While every obstetric specialist would gain by reading this monograph, every medical library ought to possess a reference copy. It elevates the science and art of obstetrics.

Medical State Board Examinations: Topical Summaries and Answers. An Organized Review of Actual Questions Given in Medical Licensing Examinations Throughout the United States. By Harold Rypins, A.B., M.D., F.A.C.P., Secretary, New York State Board of Medical Examiners. Fourth edition. Cloth. Price, $4.50. Pp. 448. Philadelphia, Montreal & London: J. B. Lippincott Company, 1939.

While the author admits in the preface that medical schools are in a better position than examining boards to test the student's academic or encyclopedic knowledge, he has designed this book apparently for the average American medical graduate, who, while admittedly well prepared for the practice of his profession, may approach the ordeal of the licensing examination with some trepidation. The compendium represents a careful study of licensing examinations throughout the United States and for this reason may assist those physicians who desire to select and rearrange in an intelligent and practical manner the material they were given during their undergraduate years.

Theories of Sensation. By A. F. Rawdon-Smith, M.A., Ph.D. Cloth. Price, $2.75. Pp. 137, with 18 illustrations. Cambridge: University Press, New York: Macmillan Company, 1938.

In this, one of the first three titles announced in the Cambridge Biological Series, Rawdon-Smith has produced a suave and interesting opus. "Theories of Sensation" might lead one to believe that the author is considering primarily physiologic theories which have to do with sensations of all kinds. Such a volume would undoubtedly be of value, but Rawdon-Smith does not write it but rather discusses theories of vision and audition only, giving the physiologic evidence. From the point of view of the various phases of these two sensory phenomena which he discusses, the volume has value. So much experimental evidence, so much discussion of the measurement of the physical properties of sensation is included that the chapters devoted to the formation of a retinal image, the duality of the retinal process, the discrimination of intensity, visual acuity and color vision give one a fairly recent and modern picture of how the laboratory physiologist sees the sensation of vision. There is, perhaps, too much anatomy included in this part, but the author seems to consider it justified as he attempts to present his material from an elementary point of view, although it becomes extremely complex, even to the point at which higher mathematics is used before he is through. In the field of audition, one of the three chapters is devoted to the unadulterated anatomy and physiology of audition with almost nothing presented regarding central function of this sensation. The other two chapters devoted to the hearing sense are on the perception of pitch and theories of the perception of loudness. There is a good bibliography appended and the style is excellent.

The monograph is scarcely comprehensive enough to be a reference book covering completely the sensations of sight and hearing but it certainly would be a valuable accessory in bringing the usual physiological textbook down to date. Some of the author's beliefs do not agree with those of current American ophthalmology or otology but enough of our side of the picture is presented to prevent the author's mildly tendentious thinking from invalidating this material to any great extent. It is a book which can be read with profit by students of medicine as they come to the topics dealt with in it. Specialists in the fields of physiology, otology and ophthalmology might well find it stimulating.

Handbuch der Viruskrankheiten mit besonderer Berücksichtigung ihrer experimentellen Erforschung. Unter Mitarbeit von K. Beller et al. Herausgegeben von Prof. Dr. E. Gildemeister, Vizepräsident des Instituts Robert Koch, Berlin, Prof. Dr. E. Haagen, Abteilungsleiter am Institut Robert Koch, Berlin, und Prof. Dr. O. Waldmann, Direktor der Staatl. Forschungsanstalten, Insel Riems bei Greifswald. In zwei Bänden. Band I. Paper. Price, 60 marks. Pp. 652, with 63 illustrations. Jena: Gustav Fischer, 1939.

This work was undertaken by the authors with the collaboration of thirty other investigators. In the first part of the volume general features, such as the historical development of virus investigations, classification and morphology of the viruses, are considered. Filtration and the manner in which viruses act in the host, as well as outside the host, are adequately discussed. Animal studies and experimental identification of viruses are considered. The cultivation and immunobiology of the viruses are described at length. The second part of the volume is concerned with epidemic fevers under the heads of pustular diseases, vesicular diseases, exanthematic diseases and diseases of septicemic character. An excellent bibliography follows each chapter. The book is well illustrated and contains three excellent colored plates showing the intracellular inclusion bodies (elementary bodies) of many of the viruses. The volume can be heartily recommended to research workers interested in virus diseases.

Keep Fit and Like It. By Dudley B. Reed, M.D., Director of Student Health Service, School of Medicine, University of Chicago. With an introduction by Morris Fishbein, M.D., Editor, Journal of the American Medical Association. Whittlesey House Health Series, Morris Fishbein, M.D., Editor. Cloth. Price, $2.50. Pp. 325, with 14 illustrations. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1939.

This book is a valuable prescription for a patient in need of exercise. It is especially adapted to the requirements of the adult intelligent male in average circumstances. Dr. Dudley B. Reed follows the rule of Asclepiades that medicine should be administered to cure quickly, safely and pleasantly (curare cito, tuto et jucunde) with the emphasis on jucunde. He first discusses exercise from the standpoint of the prescribing physician with chapters on the mechanical, physiologic and psychologic elements, but in such a joyous and interesting fashion that the scientific factors are comfortable and easy to take. He then discusses various games that the adult likes to play from the standpoint of the man who enjoys them. He likes tennis himself and he knows how to play; so will the patient who reads the book. His analysis of footwork, the American twist service, Tilden's style and the value of doubles will be approved by the athletic coach, the tennis enthusiast and the cautious physician prescribing fun and interest for a melancholy menopausing male, who will certainly keep his eye on the ball instead of his troubles. Badminton, horseback riding and skating are similarly treated. He creates an eagerness to go right out and do these excellent things just for the fun of it. Merely reading the book is good therapy. Dr. Reed is well known to the American public as a physician and the professor of hygiene and director of the university health service of the University of Chicago. His literary style ranks with the best in any language. His shrewd and homely understanding of men has seldom been rivaled. The book is far removed from the ordinary popular volume on health. It can be happily and safely recommended to physicians, patients, athletes, fathers, sons and any man who wants a good time out of life. It is part of the Whittlesey House series of popular books on health edited by Dr. Morris Fishbein, and it also carries his appreciative introduction.

Lehrbuch der Röntgendiagnostik. Von H. R. Schinz, W. Baensch und E. Friedl. Nebst Beiträgen von H. Franke et al. Band I: Skelett. Teile 1 und 2. Band II: Innere Organe. Teile 1 und 2. Fourth edition. Paper. Price, 260 marks per set of two volumes. Pp. 544; 545-997; 999-1622; 1623-2182, with 3,671 illustrations. Leipzig: Georg Thieme, 1939.

Medical books are so numerous that it seems impossible for any one to maintain a complete library relating to his own specialty. Many titles are presented, perhaps with the names of the authors unfamiliar, which do not appeal, and the physician may not even take time to look through them. But here is a wonderful work which arrests attention by its size, its attractive appearance and especially by the immediate impression of comprehensiveness when one opens at any page of either volume. It is immediately apparent that one is examining the most authoritative work on diagnostic roentgenology which has yet been published. The new edition has been brought right up to the minute. One seeks in vain to find an omission of any important radiologic discovery relating to diagnosis. The first volume, of nearly 1,000 pages, deals with the necessary knowledge of radiation physics and contains a detailed consideration of normal roentgen anatomy and the various injuries and diseases of bones and joints. An excellent exposition of ventriculography and encephalography rounds out the section on the skull. The second volume is devoted to the roentgenology of internal medicine. It is understood that an English translation is scheduled for early publication in the United States. It will be most welcome.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Coronary Thrombosis Attributed to Exertion and Mental Strain.—Addington was suffering from a sclerotic condition of the coronary arteries. One night in the course of his employment as an operating engineer in a power plant he experienced extraordinary difficulty in regulating a furnace and was forced repeatedly to climb and descend hurriedly a ladder leading from the furnace room to a boiler and control room above. To add to his troubles, a small explosion of coal dust which had accumulated around the furnace threw him against some machinery and later he was drenched with hot water from a boiler. These incidents left him exhausted, according to his testimony, and when he went home from work he was unable to eat breakfast. He was too restless to sleep for more than an hour. During the afternoon and evening he attended a picnic but was too tired to do more than sit, though he did eat a hearty picnic dinner. About 9 in the evening he was seized by excruciating pains in the chest which radiated down both arms. His condition was subsequently diagnosed as coronary thrombosis and he was disabled from that time on. Contending that the coronary thrombosis was caused by the physical exertion and mental strain that he underwent during his employment the night referred to, he brought proceedings under the workmen's compensation act of Minnesota but was denied compensation. He then appealed to the Supreme Court of Minnesota.

The heart, said the court, is a muscular structure receiving nourishment from blood conducted to its various parts by branches of the two coronary arteries. Coronary thrombosis is the closure of a coronary artery or of one of its branches "by a deposit of platelets and fibrin, components of the blood, so that circulation through the blood vessel is blocked." Something is known about the conditions which give rise to this pathologic condition but its cause is difficult to demonstrate. The closure or obstruction usually occurs where the interior of the artery has been roughened by sclerosis. The deposit usually commences at a time when the circulation is slow; thus nearly half of the cases occur while the person afflicted is in bed. The obstruction may form in a few minutes, or hours or even days may elapse. Physicians called on behalf of the workman testified that his unusual activity and mental strain proved so burdensome to his

heart that it ceased to maintain normal circulation and that the slowed circulation so caused began the formation of the obstruction which culminated the following evening in making itself felt. Physicians called by the employer, however, testified that they were unable to discover any causal connection between the exertion and the thrombosis.

The exact time that the deposit which finally obstructed one of the coronary vessels started to form, continued the court, is impossible of demonstration and any conclusion concerning the time when it did start must proceed solely from inference. Compensation has been granted for disability or death resulting from coronary thrombosis on the ground that exertion attendant on the claimant's employment was the cause. *Hill* v. *Etchen Motor Co.*, 143 Kan. 655, 56 P. (2d) 103. But in that case the coronary thrombosis manifested itself under such conditions that the exertion during work was the most likely inference as to the cause. Assuming that Addington's circulation was retarded because of cardiac strain or exhaustion caused by physical effort and nervous strain, it might be inferred that the deposit began to form then; but it might be inferred with equal probability that the slowed circulation contributing to its formation was caused by his going to bed on his return from work, or by reason of his resting after the evening meal at the picnic. Experience has shown that it is likely to occur in either of these latter circumstances. To say that it is more likely to have resulted at one time than at another is to state a speculative conclusion for which there is no preponderating proof. The cause may not be attributed to one factor when it may, with equal probability, be attached to another. Since there were several occasions between midnight and 9 in the evening when the workman's circulation would have in the natural course of events slowed so as to permit the formation of a thrombus, and since there was no basis for inferring that it was instituted at one rather than at another of these times, the court believed that there was no proof of an injury arising out of the employment. The workman, was therefore denied compensation.—*Addington v. State (Department of University Farm School) (Minn.), 281 N. W. 269.*

Birth Control: Contraceptive Literature from Abroad; When Subject to Forfeiture.—A book entitled "Parenthood: Design or Accident," addressed to claimant Nicholas, and copies of a magazine entitled *Marriage Hygiene*, addressed to claimant Himes, came from abroad through the mails and were stopped at the port of New York. After examination the Collector of the Port of New York seized the publications as contraband because they contained information relating to contraception. The United States then brought two libel proceedings to confiscate the publications under section 593 (*b*) of the Tariff Act of 1930, which provides for forfeiture of any merchandise and punishment of the offender by fine or imprisonment:

> If any person fraudulently or knowingly *imports* or brings into the United States, or assists in so doing, *any merchandise contrary to law*, or receives, conceals, buys, . . . or in any manner facilitates the transportation, concealment, or sale of such merchandise after importation, knowing the same to have been imported or brought into the United States contrary to law. . . . [Italics supplied.]

For purposes of trial the two proceedings were consolidated. The United States district court, southern district, New York, held that the publications were not subject to forfeiture and dismissed the libels. The government then appealed to the United States circuit court of appeals, second circuit.

The circuit court of appeals upheld the district court in refusing to declare the publications forfeited. The court pointed out that under postal regulations and joint regulations of the United States Treasury and Post Office departments prohibited printed matter arriving by mail from abroad must inevitably be examined at the border and detained. Printed matter so detained, as was the printed matter in this case, has not yet been imported or brought into the United States within the meaning of section 593 (*b*) of the Tariff Act and is therefore not subject to forfeiture under that section. Furthermore, while section 305 of the Tariff Act provides for the seizure of drugs, medicines or articles for the prevention of conception on their appearance at any customs office, that section has no relation to publications relating to contraception.

The court refused, however, to hold that the publications should necessarily be delivered to the addressees, the claimants. It is one thing, the court observed, to say that the publications may not be confiscated and another that the United States Post Office must forward them to the addressees. The court pointed out that on two previous occasions it had held that contraceptive devices may have lawful uses and that statutes prohibiting them should be read as forbidding them only when unlawfully employed. *Youngs Rubber Corporation* v. *C. I. Lee & Co.*, 45 F. (2d) 103, and *United States* v. *One Package*, 86 F. (2d) 737, abstracted in THE JOURNAL, April 30, 1938, page 1518. Likewise, contraceptive books and pamphlets, as those in the instant case, are lawful in the hands of those who would not abuse the information they contain. The court ordered, therefore, that the magazines seized in this case, being lawful in the hands of physicians, scientists and the like, be delivered to claimant Himes, who was the American editor of the magazine, since he was the most appropriate distributor of such magazines to persons lawfully entitled to possess them. With respect to the book seized, however, the court was unable to say whether claimant Nicholas was or was not one of those in whose hands it would be lawful. The only information the record contained about him was that he was not a physician. The burden rested on him at least to go forward with the evidence to show that he belonged to one of the privileged classes entitled to receive such information. In the judgment of the court, therefore, although the book should not be confiscated, it should not be delivered to the addressee but should go to the Dead Letter Office.—*United States v. Nicholas; Same v. Himes, 19 F. Supp. 1017; 97 F. (2d) 510.*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Chicago, Oct. 8-13. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.

American Academy of Pediatrics, Cincinnati, November 16-18. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.

American Clinical and Climatological Association, Saranac Lake, N. Y., Oct. 9-11. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Philadelphia, Oct. 16-20. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.

American Public Health Association, Pittsburgh, Oct. 17-20. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Society of Anesthetists, New York, Oct. 12. Dr. Paul M. Wood, 745 Fifth Ave., New York, Secretary.

Association of American Medical Colleges, Cincinnati, Oct. 23-25. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.

Central Association of Obstetricians and Gynecologists, Kansas City, Mo., Nov. 2-4. Dr. W. F. Mengert, University Hospitals, Iowa City, Secretary.

Central Society for Clinical Research, Chicago, Nov. 3-4. Dr. L. D. Thompson, 4932 Maryland Ave., St. Louis, Secretary.

Clinical Orthopaedic Society, Little Rock, Ark., and Oklahoma City, Oct. 13-14. Dr. H. Earle Conwell, 215 Medical Arts Bldg., Birmingham, Ala., Secretary.

Colorado State Medical Society, Colorado Springs, Oct. 4-7. Mr. Harvey T. Sethman, 537 Republic Bldg., Denver, Executive Secretary.

Delaware, Medical Society of, Wilmington, Oct. 9-11. Dr. John H. Mullin, 601 Delaware Ave., Wilmington, Secretary.

Indiana State Medical Association, Fort Wayne, Oct. 10-12. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

International Society of Medical Health Officers, Pittsburgh, October 16. Dr. Leon Banov, 12 Mill Street, Charleston, S. C., Secretary.

Inter-State Postgraduate Medical Association of North America, Chicago, Oct. 30-Nov. 3. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.

Mississippi Valley Medical Society, Burlington, Iowa, Sept. 27-29. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

National Society for the Prevention of Blindness, New York, Oct. 26-28. Mr. Lewis H. Carris, 50 West 50th St., New York, General Director.

Pacific Association of Railway Surgeons, San Francisco, Sept. 29-30. Dr. W. T. Cummins, Southern Pacific General Hospital, San Francisco, Secretary.

Pacific Coast Society of Obstetrics and Gynecology, Portland, Ore., Nov. 8-11. Dr. T. Floyd Bell, 400 29th St., Oakland, Calif., Secretary.

Pan Pacific Surgical Association, Honolulu, Sept. 15-28. Dr. F. J. Pinkerton, Young Bldg., Honolulu, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 2-5. Dr. Walter F. Donaldson, 300 Penn Ave., Pittsburgh, Secretary.

Tri-States Medical Society of Texas, Louisiana and Arkansas, Marshall, Texas, Nov. 8-9. Dr. Robert K. Womack, Longview, Texas, Secretary.

Vermont State Medical Society, Burlington, Oct. 5-6. Dr. Benjamin F. Cook, 134 Bellevue Ave., Rutland, Secretary.

Virginia, Medical Society of, Richmond, Oct. 3-5. Miss Agnes V. Edwards, 1200 East Clay St., Richmond, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

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Relation Between Prolonged PR Interval and Auricular Fibrillation in Patients with Rheumatic Heart Disease. M. D. Altschule, Boston.—p. 1.
Roentgenkymographic Studies of Myocardial Infarction. R. Gubner and J. H. Crawford, Brooklyn.—p. 8.
Value and Significance of Multiple Chest Leads in Man: I. Normal and Hypertrophied Hearts. A. Bohning, L. N. Katz, M. Robinow and G. Gertz, Chicago.—p. 25.
Effect of Fever on Postural Changes in Blood Pressure and Pulse Rate. I. Kopp, Boston.—p. 46.
Embolism and Thrombosis of Abdominal Aorta: Report of Three Unusual Cases. F. W. Fry, Hempstead, N. Y.—p. 57.
Dissecting Aneurysm of Aorta. H. Rogers, Oakland, Calif.—p. 67.
*Congenital Heart Disease in Childhood, with Special Reference to Prognosis. Rachel Ash and E. Harshaw Jr., Philadelphia.—p. 80.
Comparative Effects of Amphetamine Sulfate (Benzedrine Sulfate), Paredrine and Propadrine on Blood Pressure. J. Loman, M. Rinkel and A. Myerson, Boston.—p. 89.

Congenital Heart Disease in Childhood.—Ash and Harshaw reviewed the records of all the children (230) with congenital cardiac defects who were admitted to the wards or cardiac clinic of the Children's Hospital from 1922 to 1936. Since they were interested not only in the incidence of congenital cardiac lesions but also in their prognostic significance, during the first six months of 1938 they tried to trace and to reexamine all children not under current observation. They were successful in tracing 80 per cent of the children. Of the forty-one children who could not be located, twenty-eight had attained the age of at least 2 years when they were last seen, so that the course in the first two years is known in 217 instances, or 94.3 per cent, of the group. The total number of deaths was 102 (53.9 per cent of those traced in 1938 and 47 per cent of those who were 2 years of age or older when they were last examined). Of the deaths, 73 per cent had occurred within the first year of life and 78 per cent within the first two years. In slightly more than one half of the cases (52.9 per cent) the final illness was of infectious origin. Pneumonia headed the list of infections, causing 39 per cent of the deaths. In one third of the deaths circulatory inadequacy was a prominent feature. Of ten of the thirty-eight patients who came to necropsy, no cause of death could be found other than circulatory failure. However, no death was due to any of the common childhood diseases. It was observed that infants with congenital cardiac defects tend to be slow to gain weight and delayed in growth. Malnutrition of a noticeable degree was present in sixty-nine children. In later life these children may remain dwarfed and of fragile build. In some individuals, however, a spurt of growth occurs as puberty is reached. Mental deficiency was a not infrequent occurrence. Operative procedures were well borne, including thirty-three tonsillectomies and adenoidectomies (two of cyanotic individuals), one splenectomy, one mastoidectomy, one herniorrhaphy and one open reduction for subluxation of the elbow. There are many instances of longevity among noncyanotic individuals with congenital cardiac defects but, on the whole, the prognosis is poor for the cyanotic individual. However, a hopeless prognosis should not be assumed for any child who has survived infancy. Cyanotic children should not be deprived of schooling. Whether cyanosis is present or absent, exercise should not be restricted beyond the limiting capacity of the heart itself. Children with congenital lesions are more fortunate than those with rheumatic fever in that they do not have the additional handicap of continued systemic and myocardial infection. In spite of startling murmurs and cardiac enlargement, the functional capacity is often normal.

American Journal of Diseases of Children, Chicago

58: 237-456 (Aug.) 1939

Role of Allergy in Atelectasis in Children. T. B. Friedman, Chicago, and C. J. Molony, Los Angeles.—p. 237.
Circulatory Function in Anemias of Children: IV. Roentgenographic Measurement of Cardiac Size. C. G. Parsons, Birmingham, England, and F. H. Wright, New York.—p. 250.
Meningitis Caused by Pneumococcus Type III: Observations on Sulfanilamide Therapy. J. L. Stein, Brooklyn, and M. M. Steiner, Chicago.—p. 274.
*Total, Differential and Absolute Leukocyte Counts and Sedimentation Rates for Healthy Children: Standards for Children 8 to 14 Years of Age. E. E. Osgood, R. L. Baker, Inez E. Brownlee, Mable W. Osgood, Dorothy M. Ellis and W. Cohen, Portland, Ore.—p. 282.
Effect of Dietary Supplement on Ossification of Bones of Wrist in Institutional Children: II. Effect of Cod Liver Oil Supplement. Vera MacNair, Rock Hill, S. C.—p. 295.
Hyperpyrexia Following Operation for Cleft Lip or Palate. H. E. Irish and C. E. Stepan, Chicago.—p. 320.
Perforation of Gastrointestinal Tract of the Newborn Infant. H. E. Thelander, San Francisco.—p. 371.

Leukocyte Counts and Sedimentation Rates in Children.—Osgood and his collaborators determined the total, differential and absolute leukocyte counts and the sedimentation rates for children from 8 to 14 years of age and found that there were no significant age or sex differences. The differential and absolute cell counts show a higher proportion of lymphocytes (from 1,500 to 6,500) and a lower proportion of neutrophil lobocytes (from 1,500 to 6,500) than have usually been given. The probable explanation for this is that most of the data previously reported have not been obtained from studies of strictly healthy persons. The sedimentation rates form a skew curve, with the greater number of determinations falling in the lower ranges. It is probable that the rate of 15 mm. in forty-five minutes, which tops 80 per cent of the results, represents the strict upper limit of normal and that the higher rates are due to mild chronic infection in the tonsils, teeth or sinuses not detectable in the routine physical examination.

American Journal of Pathology, Boston

15: 391-500 (July) 1939. Partial Index

Cytologic Changes Induced in Hypophysis by Prolonged Administration of Pituitary Extract. A. E. Severinghaus, New York, and K. W. Thompson, New Haven, Conn.—p. 391.
Lymphocyte in Acute Inflammation. F. Kolouch Jr., Minneapolis.—p. 413.
Differentiation Between Spirochetes and Spirochete-like Structures in Placenta. P. F. Sakyoun, Beirut, Syria.—p. 435.
Experimental Pneumonia Produced by Typhus Rickettsiae. M. R. Castaneda, Mexico City, Mexico.—p. 467.
Histoplasmosis in Infancy: Report of Case. A. L. Amolsch and J. H. Wax, Detroit.—p. 477.
*Malabsorption of Fat (Intestinal Lipodystrophy of Whipple): Report of Case. H. L. Reinhart and S. J. Wilson, Columbus, Ohio.—p. 483.

Malabsorption of Fat.—Reinhart and Wilson report a case of intestinal lipodystrophy similar to that first described by Whipple. The early clinical manifestations were predominantly those of a blood dyscrasia, which was carefully studied in its hematologic aspects. These studies led to a tentative diagnosis of a benign pseudoleukemic lymphocytosis, relative neutropenia and a moderate hypochromic microcytic anemia. With the development of chylous ascites an obstruction of the thoracic duct due to lymphadenosis or carcinoma was postulated. In contrast with the cases reported by Whipple, Blumgart and Jarcho, fatty diarrhea was not a prominent clinical symptom and there was no evidence of rheumatic fever. The massive deposition of fat in the sinuses of the mesenteric and retroperitoneal lymph nodes represents a quantitative increase of lipids. Emaciation and depletion of body fat, among the striking clinical manifestations of these cases, suggest the possibility of increased excretion of fat into the intestine. Inadequate data are available to suggest a change of the bacterial flora of the intestine which might increase cholesterol absorption. The evidence suggests massive excretion of fat into the intestine and an increased reabsorption of fat from the intestine. The term "intestinal lipodystrophy" as suggested by Whipple would seem to be most appropriate. In contrast with the xanthomatous diseases, these cases present large aggregates of extracellular as well as intracellular fat. A fundamentally different type of cell is probably involved.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

42: 1-160 (July) 1939

Determination of Heart Size. F. J. Hodges, Ann Arbor, Mich.—p. 1.
Visualization of Chambers of Heart, Pulmonary Circulation and Great Blood Vessels in Heart Disease: Preliminary Observations. G. P. Robb and I. Steinberg, New York.—p. 14.
Inflammatory Diseases of Pericardium. E. Freedman, Cleveland.—p. 38.
Roentgenologic Aspects of Acquired Valvular Heart Disease. M. C. Sosman, Boston.—p. 47.
Roentgenologic Aspects of Nonvalvular Disease of Heart. G. Levene, Boston.—p. 60.
Roentgenology of Congenital Cardiovascular Disease. H. Roesler, Philadelphia.—p. 72.
Roentgen Examination of Aorta and Pulmonary Artery. M. L. Sussman, New York.—p. 75.
Persistent Vertebral Process Epiphyses. W. Bailey, Los Angeles.—p. 85.
Motion in Vertebral Column. J. F. Elward, Washington, D. C.—p. 91.
Fractures of Sacrum: Their Incidence in Fracture of Pelvis. J. P. Medelman, St. Paul.—p. 100.
Congenital Pseudarthrosis of Tibia. C. R. Scott, New Haven, Conn.—p. 104.
Physiologic Effects of Radiation: III. Lethal Effect of Roentgen Radiation Produced by Various Kilovoltages (50 to 1,000 Kv.) on Brown-Pearce Rabbit Epithelioma. R. A. Harvey, R. Dresser and S. L. Warren, Rochester, N. Y.—p. 110.
Relation Between Tin and Copper Filtration When Using Thick-Walled Roentgen Tube. M. C. Reinhard and H. L. Goltz, Buffalo.—p. 122.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

23: 413-548 (July) 1939

*Syphilimetry with Exclusion Slide Tests in Forty-Four Cases of Early Treated Syphilis: Preliminary Report. B. Levine, S. Littman and B. S. Kline, New York.—p. 413.
Effect of Testosterone Propionate on Course of Experimental Rabbit Syphilis. J. E. Kemp, C. Shaw and Elsie Mae Fitzgerald, Chicago.—p. 430.
Lowered Resistance to Syphilitic Infection in Ovariectomized Rabbits. C. K. Hu, Peiping, China.—p. 446.
Sodium Sulfanilyl-Sulfanilamide in Treatment of Gonorrhea in Male. W. L. James and H. L. Sutton, Newark, N. J.—p. 453.
Gonococcus Complement Fixation Test in Gonococcic Infections Treated with Sulfanilamide. A. Cohn, New York.—p. 461.
*Hospitalized Male Gonorrhea Patients (473) Treated with Sulfanilamide. J. R. Waugh and T. R. Dawber, Norfolk, Va.—p. 477.
Erythema of Ninth Day Following Arsphenamine Therapy. N. N. Epstein and E. A. Levin, San Francisco.—p. 490.
Combating Venereal Diseases in Soviet Russia. S. M. Danyushevsky, Moscow, Soviet Russia.—p. 498.
Recent Progress Against Syphilis and Gonorrhea and Its Relation to National Defense. R. A. Vonderlehr, Washington, D. C.—p. 506.
The Syphilitic's Pater Noster. L. Goldman, Cincinnati.—p. 511.

Syphilimetry with Exclusion Slide Tests.—Levine and his associates found that the microscopic slide precipitation tests for the exclusion of syphilis reacting with a small amount of reagin have served well as criteria of the presence or absence of the disease in forty-four cases. The series comprised primary, secondary and congenital syphilis observed within several months of infection. During treatment the blood tests were frequently repeated and, when at least three consecutive exclusion slide tests at intervals of a week or more were negative, a spinal fluid examination was made and, if this was negative for evidence of syphilis, treatment was discontinued. The average period of treatment (continuous, alternating arsenicals and bismuth compounds) was twenty-three months, the minimum five weeks, the maximum more than five years. Seventy patients have been followed clinically, roentgenographically, serologically and by examination of the spinal fluid for from eight months to twelve years and found to date to be free from all signs and symptoms of the disease. Studies of the central nervous system and the cardiovascular system are indicated in these cases, but it is concluded by the authors that the exclusion slide tests for syphilis are of the greatest value in the early detection of the disease and more satisfactory in the control of its adequate treatment than therapy by schedule.

Gonorrhea Treated with Sulfanilamide.—Waugh and Dawber used sulfanilamide in the treatment of 473 hospitalized male gonorrhea patients. They attempted to standardize the dosage; 120 grains (8 Gm.) of sulfanilamide in four divided doses for the first twenty-four hours and then 60 grains (4 Gm.) in four divided doses daily for fourteen days longer. Of the 473 patients 75 per cent completed the full fifteen days of treatment. Of the patients treated with sulfanilamide alone 92 per cent had clear urine (except for some shreds) compared to only 26 per cent among patients treated by the old routine methods used during six months before treatment with sulfanilamide was instituted. There were 65 per cent apparent recoveries from gonorrhea. There was no appreciable difference in the percentage of apparent recoveries between acute and chronic infections. The full fifteen days of treatment was not completed by 12.5 per cent of the patients because of both severe and mild reactions, and another 12.5 per cent did not complete the full treatment because of lack of improvement or unwillingness to remain in the hospital. There were a few apparent recoveries after as few as three days of treatment with sulfanilamide. Complications of gonorrheal urethritis other than prostatitis were present at the time of admission and before treatment with sulfanilamide was instituted in 12.5 per cent of the 473 patients. There were 90 per cent apparent recoveries in these cases, compared to 64 per cent in the so-called uncomplicated cases, in many of which prostatitis was present in addition to urethritis. Complications during treatment occurred in 0.4 per cent. Reactions sufficiently severe to warrant discontinuance of sulfanilamide occurred in 8 per cent of the 473 cases, among which were included dermatitis, fever, anorexia, nausea or vomiting, abdominal pains, diarrhea, mental confusion, severe anemia, severe anemia with jaundice and granulocytopenia with angina. Among blood counts done in 314 cases, 17.5 per cent showed some degree of anemia; but only 3.2 per cent of the blood counts were below 3.5 million red blood cells.

American Review of Tuberculosis, New York

40: 131-242 (Aug.) 1939

Follow-Up Study of Tuberculous Patients: Patients Discharged from County Sanatorium. D. R. Hastings and Esther R. Doerr, Oak Terrace, Minn.—p. 131.
Marital Tuberculosis: Study of 210 Couples in Which Both Husband and Wife Have Clinical Tuberculosis. H. I. Spector, St. Louis.—p. 147.
Oxygen Tension and Tubercle Bacillus. W. Kempner, Durham, N. C.—p. 157.
Crotonaldehyde in Experimental Tuberculosis. R. L. Ingersoll, Mildred Winn and C. C. Lindegren, Los Angeles.—p. 169.
*Coexisting Tuberculosis and Syphilis. F. C. Warring Jr., Shelton, Conn.—p. 175.
Evolution of Hematogenous Pulmonary Tuberculosis into Bronchogenic Tuberculosis. S. Cohen, Jersey City, N. J.—p. 188.
Nontuberculous Upper Lobe Bronchiectasis: Report of Three Cases. A. B. Rilance and K. S. Howlett Jr., Shelton, Conn.—p. 204.
Calcification of Pleura. C. Floyd and R. H. Hepburn, Boston.—p. 213.

Coexisting Tuberculosis and Syphilis.—From January 1928 to January 1938, routine serologic tests for syphilis were performed on 2,160 patients admitted to the Laurel Heights State Tuberculosis Sanatorium. Warring studied the interrelations of tuberculosis, syphilis and antisyphilitic treatment in the cases in which the two diseases coexisted. The incidence of syphilis in these admissions was 4 per cent (eighty-seven cases). There were twenty-two instances showing positive or doubtful reactions that could not be given a final diagnosis of syphilis. There were eleven repeatedly doubtful reactors. These constitute 10 per cent of the total reactors and it is felt that this is a larger proportion than is generally found in the syphilis clinics. This brings up the question of false doubtful or false positive reactions for syphilis obtained in tuberculous patients. Parran and Emerson sent blood from 458 supposedly nonsyphilitic tuberculous patients to five eminent serologists. They found both typical and atypical false doubtful and false positive results in these serums and felt that tuberculous toxemia might contribute a confusing factor to serologic tests for syphilis. It was ascertained that the incidence of active tuberculosis in syphilitic persons is not greater than in nonsyphilitic individuals. The extent of the tuberculosis was practically the same in the two groups when they were admitted to the sanatorium. However, pulmonary tuberculosis in the syphilitic patients did not respond as favorably to sanatorium treatment as did the disease in the nonsyphilitic persons. Antisyphilitic treatment might be suspected as the cause of the poor showing among the syphilitic group of patients. Whether the administration of antisyphilitic drugs can be responsible for unfavorable changes in the course of pulmonary tuberculosis is not known. Patients can be selected carefully for treatment and the drugs given with caution and still a spread of the phthisis may occur. Yet remissions are notorious in uncomplicated tuberculosis itself. So even with all the facts of a given case at hand it is usually impossible to say

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whether the increase in the pulmonary disease was to be expected by the law of possibility or was the direct result of antisyphilitic treatment. The response of syphilis to treatment of patients with tuberculosis does not appear to differ from the course of the disease in nontuberculous persons.

Annals of Internal Medicine, Lancaster, Pa.

13:1-224 (July) 1939

Virus Infection of Chick Embryo. E. W. Goodpasture, Nashville, Tenn. —p. 1.
Visualization of Chambers of Heart and Thoracic Blood Vessels in Pulmonary Heart Disease: Case Study. G. P. Robb and I. Steinberg, New York.—p. 12.
*Untoward Effects from Use of Ergot and Ergotamine Tartrate. M. W. Comfort and C. W. Erickson, Rochester, Minn.—p. 46.
*Vitamin A Content of Human Liver in Tuberculosis. P. D. Crimm and D. M. Short, Evansville, Ind.—p. 61.
Role of Symptoms and Signs in Amebiasis. M. Paulson and J. Andrews, Baltimore.—p. 64.
Intersexuality or Pseudohermaphrodism. A. C. Ivy, R. R. Greene and M. W. Burrill, Chicago.—p. 68.
Obesity and Hypertension: Clinical and Experimental Observations. J. E. Wood Jr. and J. R. Cash, University, Va.—p. 81.
Influence of Iron and Diet on Blood in Pregnancy. F. H. Bethell, S. H. Gardiner and Frances MacKinnon, Ann Arbor, Mich.—p. 91.
Treatment of Stokes-Adams Syndrome by Hypertonic Glucose Solution Given Intravenously. L. H. Sigler, Brooklyn.—p. 101.
Sudden and Unexpected Death from Acute Interstitial Myocarditis: Report of Three Cases. F. C. Helwig and E. W. Wilhelmy, Kansas City, Mo.—p. 107.
Incidence of Pneumococcus Types and Reliability of the Neufeld Typing Method. H. F. Dowling and T. J. Abernethy, Washington, D. C.—p. 115.
Treatment of Heart Failure. G. Herrmann, Galveston, Texas.—p. 122.
Interpretation of Electrocardiographic Findings in Calcareous Stenosis of Aortic Valve. T. J. Dry and F. A. Willius, Rochester, Minn.—p. 143.
Asthmatoid Heart Failure: Form of Left Ventricular Failure and Its Differentiation from Bronchial Asthma by Circulation Time and Other Criteria. M. Plotz, Brooklyn.—p. 151.
Suggested Revisions of Medical Pharmacology. P. D. Lamson, Nashville, Tenn.—p. 161.

Reactions from Ergot and Ergotamine Tartrate.—Comfort and Erickson review the literature dealing with untoward effects from the use of ergot or of ergotamine tartrate preparations. To these they add two personal cases in which untoward effects developed following the use of ergotamine tartrate for the control of pruritus. The untoward effects that have been reported have followed administration of doses larger than those compatible with good practice, when small doses were used the reactions apparently depending on the existence of an idiosyncrasy to the drug. Some untoward effects have followed the use of the drug in the usual doses and were apparently due to a cumulative action of the drug. In spite of these many instances of ergotism the authors do not intend to discourage administration of ergotamine tartrate in proper doses, provided adequate precautions are taken. The drug has proved itself too valuable for this, especially in the control of pruritus and migraine. Instead, they would emphasize the contraindications to its use, the danger of the development of ergotism and the fact that the onset of ergotism may be suspected early by frequent examination of the arteries of the extremities for spasm and by recognition of its early symptoms. Prompt and early recognition of ergotism and the discontinuation of ergot or ergotamine tartrate medication, followed by the administration of vasodilating drugs, are the prerequisites for the avoidance of irreparable damage.

Vitamin A of Human Liver in Tuberculosis.—Crimm and Short point out that the average liver content of vitamin A of fifty tuberculous patients (342 units per gram of liver) compares favorably with that reported (331 units) previously for healthy persons. However, this is far from the saturation point, as evidenced by the wide variation between it and individual cases. The average is about one fifth of the maximal finding (1,640 units). The distribution according to age is not significant, except for the fact that in older persons the vitamin A content is somewhat increased. The abundant nutrition given tuberculous patients and the prolonged duration of the fibrotic disease would account for these results. The vitamin A content of the human liver approached depletion in 14 per cent of the patients. All patients with enteritis had values below the average. Therefore the administration of generous doses of vitamin A is indicated in tuberculosis with pyrexia or enteritis.

Archives of Internal Medicine, Chicago

64: 217-408 (Aug.) 1939

*Effect of Dihydrotachysterol in Treatment of Parathyroid Deficiency. E. Rose and F. W. Sunderman, Philadelphia.—p. 217.
*Evaluation of Sulfanilamide in Treatment of Patients with Subacute Bacterial Endocarditis. W. W. Spink and F. H. Crago, Minneapolis. —p. 228.
Myocardial Infarction Without Significant Lesions of Coronary Arteries. H. Gross and W. H. Sternberg, New York.—p. 249.
Hemolytic Jaundice: Immediate and Delayed Changes in Blood After Splenectomy. J. C. Sharpe, C. W. McLaughlin Jr. and R. Cunningham, Omaha.—p. 268.
Polyostotic Fibrous Dysplasia: Report of Case. T. Horwitz and A. Cantarow, Philadelphia.—p. 280.
Boeck's Sarcoid: Autopsy in Case with Visceral Lesions. E. F. Cotter, Nashville, Tenn.—p. 286.
Cardiac Sequelae of Embolism of Pulmonary Artery. H. Horn, S. Dack and C. K. Friedberg, New York.—p. 296.
Calcium and Digitalis Synergism: Toxicity of Calcium Salts Injected Intravenously into Digitalized Animals. P. K. Smith, A. W. Winkler and H. E. Hoff, New Haven, Conn.—p. 322.
*Relation of Myasthenia Gravis to Hyperthyroidism. M. W. Thorner, Philadelphia.—p. 330.
Heart Failure in Subacute Bacterial Endocarditis. W. C. Buchbinder and O. Saphir, Chicago.—p. 336.
Clinical Significance of Variations in Serum Phosphatase in Hepatic and Biliary Disorders. L. Winkelman and A. Schiffmann, Brooklyn.—p. 348.
Infectious Diseases. H. A. Reimann, Philadelphia.—p. 362.

Dihydrotachysterol for Parathyroid Deficiency.—The effects of dihydrotachysterol on five patients with parathyroid deficiency following thyroidectomy from five months to thirteen years previously are reported by Rose and Sunderman. The patients were given a diet the calcium content of which was approximately 1 Gm. daily. All rejected food was weighed and the calcium content calculated. The results confirm the previous reports in that dihydrotachysterol was effective in relieving the symptoms of parathyroid deficiency and increasing the concentration of serum calcium. The danger of producing toxic symptoms and hypercalcemia by large doses is emphasized by such an experience in one patient. In four patients the response to dihydrotachysterol was relatively prompt; the concentration of total serum calcium returned to normal, with corresponding relief of symptoms, in from four to nine days after the beginning of treatment. The fifth patient had received no previous treatment and presented relatively mild symptoms; she showed a slow, progressive increase in concentration of serum calcium, with corresponding gradual clinical improvement. The degree of hypocalcemia and the severity of symptoms are not equally correlative.

Sulfanilamide for Bacterial Endocarditis.—During the past year Spink and Crago gave sulfanilamide to twelve patients with subacute bacterial endocarditis. Organisms were recovered repeatedly from the blood of the twelve patients. In the first case there was evidence of meningitis due to Staphylococcus albus in addition to bacterial endocarditis. After the diagnosis of bacterial endocarditis had been established, the patient was apparently "cured" and remained so for seven months. Of considerable interest were the minimal changes observed in the endocardium at necropsy. Bacterial endocarditis was apparently engrafted on a previously normal valve. The lack of extensive damage to the mitral valve over such a long period might be explained on the basis of invasion of tissues by an organism of low virulence or by the bacteriostatic effect of sulfanilamide. The second patient has been in good health for nine months after sulfanilamide therapy. Before sulfanilamide was given a quantitative study of blood cultures showed thirty colonies of Streptococcus viridans per cubic centimeter of blood on one occasion and 200 colonies on another. In the remaining ten cases, in which the etiologic agent was Streptococcus viridans, the authors do not believe that sulfanilamide therapy had any desirable effect on the course of the disease. In six of the twelve cases sulfanilamide did render the blood stream sterile, determined by cultures of venous blood. However, this bactericidal effect appeared to be only temporary, except in the first two cases. In two cases in which the blood was rendered free from bacteria by sulfanilamide, bacteremia was again established when the drug was discontinued for forty-eight hours. Since the prolonged administration of sulfanilamide did not sterilize the blood in six cases it may be that certain strains of Streptococcus viridans are more readily destroyed by sulfanilamide than others. This problem is being studied. All of the twelve patients were febrile during their illnesses. There was a definite decline of the temperature of four coincident with the

administration of sulfanilamide. In five cases the drug did not appear to affect either the temperature or the bacteremia. In two sulfanilamide therapy had no effect on either the fever or the bacteremia and in one after sulfanilamide was given the temperature became and remained normal but the bacteremia was unaffected. Although all the patients had some degree of anemia during their illness, in only one could a rapid decline in the hemoglobin and erythrocyte levels be attributed to sulfanilamide. There was no further decline when the drug was discontinued. In no instance did sulfanilamide cause a depression of the leukocyte level. In two cases there was a definite and marked increase of the leukocytes during the administration of sulfanilamide. No definite relation between the amount of sulfanilamide present in the blood and its effect on the bacteremia could be elicited. The authors suggest that, since sulfanilamide may have a bacteriostatic effect on some strains of Streptococcus viridans, sulfanilamide probably should be administered to any patient with valvular lesions who may be subjected to oral surgical procedures. It is well known that, after the extraction of teeth or after a tonsillectomy, temporary bacteremia with Streptococcus viridans may result.

Myasthenia Gravis and Hyperthyroidism.—Thorner reports a case of myasthenia gravis in which the appearance of hyperthyroid symptoms was attended by a lessening of the myasthenic symptoms. The administration of thyroid substance coincided with a period of remission of the myasthenic symptoms. In two cases previously reported by others there was some evidence of this same type of "seesaw" balance between myasthenia gravis and exophthalmic goiter. For these reasons the author suggests that the two diseases are mutually antagonistic and that this relation is a matter of scientific, but not of immediate therapeutic, importance.

Archives of Pathology, Chicago

28: 129-282 (Aug.) 1939

Acute Postoperative Esophageal, Gastric and Duodenal Ulcerations: Further Study of Pathologic Changes in Shock. A. Penner and Alice Ida Bernheim, New York.—p. 129.

Atrophy of Cremaster Muscle. J. R. McDonald and C. W. Mayo, Rochester, Minn.—p. 141.

New Bone Formation in Primary Carcinoma of Prostate Gland. L. L. Ashburn, Washington, D. C.—p. 145.

Disseminated Encephalomyelitis of Dog. L. S. King, Princeton, N. J. —p. 151.

Production of Xanthoma in Rabbits. H. P. Rusch, C. A. Baumann and B. E. Kline, Madison, Wis.—p. 163.

Spontaneous Ophthalmic Mutation in Laboratory Mouse. F. L. P. Koch, New York, and J. W. Gowen, Ames, Iowa.—p. 171.

Membrane Formation at Lipoid-Aqueous Interfaces in Tissues: II. Correlation of Morphologic and Chemical Aspects. G. M. Hass, Boston.—p. 177.

Transplantation of Tooth Germ Elements to Marrow Cavities of Tibias of Kittens. C. J. Sutro and L. Pomerantz, New York.—p. 199.

Solid to Cystic Degeneration in Ameloblastoma. H. B. G. Robinson, St. Louis, and W. R. J. Wallace, Rochester, N. Y.—p. 207.

Attempts to Propagate Fowl Tumors Produced by Benzpyrene and by Virus: Sites of Implantation Used: Eye of Chicken and Chorio-Allantoic Membrane of Chick Embryo. S. Rothbard and J. R. Herman, New York.—p. 212.

Primary Carcinoma of Liver. J. Loesch, Oneonta, N. Y.—p. 223.

Classification and Pathology of Renal Disease in Dog: Comparison with Nephritis in Man. F. Bloom, Flushing, N. Y.—p. 236.

Endocrinology, Los Angeles

23: 161-336 (Aug.) 1939. Partial Index

Relation Between Growth Promoting Effects of Pituitary and Thyroid Hormone. H. M. Evans, Miriam E. Simpson and R. I. Pencharz, Berkeley, Calif.—p. 173.

Comparative Studies of Gonadotropic Hormones: VI. Some Effects of Long-Continued Daily Injections. C. F. Fluhmann, San Francisco.—p. 193.

*Observations on Nitrogen and Calcium Balances as Affected by Growth and Gonadotropic Hormones Administered for Short Periods to Growing Children. J. A. Johnston and J. W. Maroney, Detroit.—p. 199.

Physiologic Studies in Insulin Treatment of Acute Schizophrenia: Choline Esterase Activity of Blood Serum. L. O. Randall and E. M. Jellinek, Worcester, Mass.—p. 276.

Physiologic Studies in Insulin Treatment of Acute Schizophrenia: Blood Minerals. J. M. Looney, E. M. Jellinek and Cora G. Dyer, Worcester, Mass.—p. 282.

Changes in Growth and Function of Thyroid After Thyrotropic Stimulation. W. C. Cutting, San Francisco.—p. 286.

Some Experiments on Salt and Water Metabolism in Diabetes Insipidus. H. G. Swann, Chicago.—p. 288.

Nitrogen and Calcium Balances as Affected by Growth.—Johnston and Maroney estimated the nitrogen balance, and in some instances the calcium balance, in children of the prepuberty and postpuberty periods following the administration for short periods of a preparation of the pituitary growth hormone and gonadotropic substance. A variety of responses followed—anabolic, catabolic and negative—which the authors explain as probably being conditioned by the presence or absence of a hormone defect, the state of the stores as judged by the control balance and the age of the child. Subjects included several girls with menstrual difficulties at puberty, four dwarfs —a cretin, one with achondroplasia and two with ateleiosis—and a number of children who apparently had no endocrine abnormalities. Instances of complete loss of response in the nature of antihormone effect were encountered.

Journal of Bacteriology, Baltimore

38: 1-120 (July) 1939. Partial Index

Factors Governing Development of Variational Structures Within Bacterial Colonies. I. E. Shinn, Pittsburgh.—p. 5.

Effect of Carcinogenic and Other Hydrocarbons on Growth of Escherichia Communior. S. H. Hopper and D. B. Clapp, Cambridge, Mass.—p. 13.

Demonstration of Phase Variation in Salmonella Abortus-Equi. P. R. Edwards and D. W. Bruner, Lexington, Ky.—p. 63.

Journal of Experimental Medicine, New York

70: 117-222 (Aug.) 1939

Lung Edema Following Bilateral Vagotomy: Studies on Rat, Guinea Pig and Rabbit. V. Lorber, Minneapolis.—p. 117.

Immune Response of Rabbits to Injection of Plasmodium Knowlesi. M. D. Eaton and L. T. Coggeshall, New York.—p. 131.

Production in Monkeys of Complement-Fixing Antibodies Without Active Immunity by Injection of Killed Plasmodium Knowlesi. M. D. Eaton and L. T. Coggeshall, New York.—p. 141.

Familial Mammary Tumors in Rabbit: I. Clinical History. H. S. N. Greene, Princeton, N. J.—p. 147.

Id.: II. Gross and Microscopic Pathology. H. S. N. Greene, Princeton, N. J.—p. 159.

Id.: III. Factors Concerned in Their Genesis and Development. H. S. N. Greene, Princeton, N. J.—p. 167.

Hepatic Injury on Nutritional Basis in Rats. P. György and H. Goldblatt, Cleveland.—p. 185.

Role of Inborn Resistance Factors in Mouse Populations Infected with Bacillus Enteritidis. L. T. Webster and H. L. Hodes, New York.—p. 193.

*Neutralization of Epidemic Influenza Virus: Linear Relationship Between Quantity of Serum and Quantity of Virus Neutralized. F. L. Horsfall Jr., New York.—p. 209.

Neutralization of Epidemic Influenza Virus.—Horsfall investigated the quantitative relationships of the neutralization of epidemic influenza virus by homologous antiserum. The results of the experiments indicate that under certain conditions a linear relationship exists between the quantity of virus neutralized and the quantity of serum. When the logarithm of the amount of virus neutralized is plotted against the logarithm of the quantity of serum, the neutralization of virus appears to approximate a straight line. This relationship has been found to be the same for the serum of a ferret convalescent from experimental influenza and the serum of a rabbit immunized with the virus. Calculation of both the 50 per cent mortality end point and the so-called 50 per cent maximal score end point has shown the relationship to be independent of the end point chosen. By means of the linear relationship between virus and antiserum it is possible to determine a fixed, rather than a relative, value for the neutralizing capacity of a serum.

Journal of Immunology, Baltimore

37: 1-84 (July) 1939

Antigenic Structure of Hemolytic Streptococci of Lancefield Group A: IV. Nucleoprotein Components: Some Chemical and Serologic Properties and Changes in Both Caused by Certain Enzymes. C. A. Zittle, Philadelphia.—p. 1.

Protection of Mice Against Haemophilus Pertussis by Serum: Comparison of Protection with Agglutination: Preliminary Paper. Lucy Mishulow, I. F. Klein, Mildred M. Liss and Lillian Leifer, New York. —p. 17.

Polyvalency of Crotalidic Antivenins: I. Influence of Composition of Polyvalent Antigens. T. S. Githens and N. O. Wolff, Glenolden, Pa. —p. 33.

Id.: II. Comparison of Polyvalent Crotalidic Antivenin with Monovalent Crotalus Durissus Durissus Antivenin. T. S. Githens and N. O. Wolff, Glenolden, Pa.—p. 41.

Id.: III. Mice as Test Animals for Study of Antivenins. T. S. Githens and N. O. Wolff, Glenolden, Pa.—p. 47.

Isolation and Properties of Specific Polysaccharide of Type B Haemophilus Influenzae. J. H. Dingle and L. D. Fothergill, Boston.—p. 53.

Production and Preservation of Specific Antiserums for Blood Group Factors A, B, M and N. W. C. Boyd, Boston.—p. 65.

Note on Calculation of Antibody-Antigen Ratio. A. E. How, St. Louis. —p. 77.

Journal of Infectious Diseases, Chicago

65: 1-96 (July-Aug.) 1939

Action of Antipneumococcus Serum in Pneumonic Rat and Its Penetration into Pulmonary Lesion. Alice H. Kempf and W. J. Nungester, Ann Arbor, Mich.—p. 1.
Polysaccharide Fraction from Cysticercus Crassicollis and Its Role in Immunity. D. H. Campbell, Chicago.—p. 12.
Haemophilus Pertussis Vaccines: Effect of Washing and Use of Mouse Protection Tests. J. J. Miller Jr. and Rosalie J. Silverberg, San Francisco.—p. 16.
I. Organisms of Klieneberger and Streptobacillus Moniliformis. L. Dienes, Boston.—p. 24.
Isolation of Rabbit Papilloma Virus Protein. J. W. Beard, Durham, N. C.; W. R. Bryan, and R. W. G. Wyckoff, Princeton, N. J.—p. 43.
Bacteriophage Therapy: I. Effect of Bacteriophage on Cutaneous Staphylococcic Lesions in Rabbits. J. Bronfenbrenner and S. E. Sulkin, St. Louis.—p. 53.
Id.: II. Prophylactic and Therapeutic Effect of Bacteriophage and of Antivirus in Experimental Infections of the Eye. J. Bronfenbrenner and S. E. Sulkin, St. Louis.—p. 58.
Id.: III. Nature of Deleterious Effect of Local Application of Staphylococcus Bacteriophage. J. Bronfenbrenner and S. E. Sulkin, St. Louis.—p. 66.
Effect of Electrolytes on Flocculation Reaction of Ramon. A. Tasman and A. C. Brandwijk, Utrecht, Holland.—p. 73.
Relationship Between Humoral and Tissue Immunity in Experimental Poliomyelitis. E. H. Lennette, Chicago, and N. P. Hudson, Columbus, Ohio.—p. 78.
Experimental Syphilitic Keratitis in Rabbit II. A. J. Gelarie, New York.—p. 84.
Potentiation of Tetanus Toxin by Tissues and Chemicals. B. Zuger, A. Hollander and U. Friedemann, Brooklyn.—p. 86.
Serologic Classification of Corynebacterium Equi. D. W. Bruner, W. W. Dimock and P. R. Edwards, Lexington, Ky.—p. 92.

Journal of Lab. and Clinical Medicine, St. Louis

24: 1009-1118 (July) 1939. Partial Index

Hematologic Studies in Acute Infections. E. L. Amidon, Burlington, Vt.—p. 1009.
Antacid Properties of Magnesium Trisilicate in Normal Subjects and Patients with Peptic Ulcers. P. Kurtz, Indianapolis.—p. 1015.
Effect on Bacteriophage of Prontylin, Prontosil, Sulfapyridine and Other Antiseptics and Dyes Used in Surgical Practice. Helen Zaytseff-Jern and F. L. Meleney, New York.—p. 1017.
Rationale of Use of Testosterone Propionate in Functional Uterine Bleeding and Dysmenorrhea. H. S. Rubinstein, Baltimore.—p. 1026.
Experience with Zinc Insulin Crystals. C. M. Levin, E. A. Kleefield and F. A. Luciano, Jamaica, N. Y.—p. 1030.
Photocolorimetric Determination of Vitamin A and Carotene in Human Plasma. Marian Stark Kimble, Madison, Wis.—p. 1055.
*Effects of Anesthetic Drugs on Rats Treated with Sulfanilamide. J. Adriani, New York.—p. 1066.
Use of Reducing Factor of Pregnancy Urine in Diagnosis of Pregnancy. D. E. Bowman, Cleveland.—p. 1072.
Negative Serologic Reaction for Syphilis in Nine Patients with Infectious Mononucleosis. J. H. Mills and Elsa Jahn, Baltimore.—p. 1076.
*Simple Technic for Concentrating Tubercle Bacilli in Sputum. N. P. Sullivan and H. J. Sears, Portland, Ore.—p. 1093.

Anesthesia and Sulfanilamide.—Adriani studied the reactions of rats treated with sulfanilamide and subjected to anesthesia with the various commonly used drugs. He finds that rats treated with sulfanilamide react with little difference to volatile or gaseous anesthetics than do untreated controls. However, the barbituric acid derivatives of the short and ultra short acting groups which are ordinarily used for surgical anesthesia are not borne well by rats having had sulfanilamide. Rats treated with sulfanilamide and then given evipal, pentothal, thioethamyl, amytal or pentobarbital sodium showed effects unlike untreated rats. The subanesthetic doses became anesthetic and often lethal. Anesthetic doses were usually lethal. The thio derivatives of barbituric acid were the worst offenders. Rats treated with sulfanilamide and allowed four days for recovery did not show this reaction. It was also less intense early in sulfanilamide therapy and more intense with increased dosage of the drug. It is suggested that the combination of sulfanilamide and barbiturates may be unwise in human therapy.

Concentrating Tubercle Bacilli in Sputum.—Sullivan and Sears outline an enzyme-digestion method, using a crude preparation of the enzyme papain as a digestant, for concentrating the tubercle bacilli in sputum, which they believe has the following advantages: 1. Digestion of sputum is rapid, usually being complete within ten to fifteen minutes. 2. No neutralization of the digestant is required. 3. The sediment obtained from the enzyme digestion adheres well to glass slides, allowing thicker smears. 4. Cultures and animal inoculations can be made from the sediment after appropriate treatment to destroy non-acid fast organisms, which are not affected by the digestant.

Journal of Nervous and Mental Disease, New York

90: 157-296 (Aug.) 1939

Cerebral Lesions Due to Vasomotor Disturbances Following Brain Trauma. M. Helfand, New York.—p. 157.
*Blood Pressure Changes During Insulin Shock Treatment. J. Pessin, Madison, Wis.—p. 180.
Physicochemical Mechanisms in Convulsive Reactivity (Permeability Changes Induced by Epileptogenous Agents and by Anesthetics). E. A. Spiegel and Mona Spiegel-Adolf, Philadelphia.—p. 188.
Periodic Paralysis: Report of Two Fatal Cases. W. A. Smith, Atlanta, Ga.—p. 210.
Prolonged Nonhypoglycemic Coma Occurring During Course of Insulin Shock Therapy: Review of Literature with Report of Nine Cases. H. Freed and E. Saxe, Philadelphia.—p. 216.

Blood Pressure During Insulin Shock.—Pessin reports the data on blood pressure changes of four patients undergoing insulin shock treatment. As one of these patients received two series of treatments, five sets of data are presented. The blood pressure of each patient was taken immediately before the injection of a shock producing dose of insulin and each half hour subsequently until treatment for the day was terminated. This was repeated each day during the entire course of treatment. From a total of 1,504 blood pressure readings the arithmetical mean (average) for each half hour on each patient was computed. The data of all five graphs indicate that insulin in doses large enough to produce shock caused a rise in the mean systolic blood pressure which occurred from one to two hours (most frequently one and one half hours) after the injection of insulin and which varied from 8 to 37 mm. of mercury. In two graphs this rise remained throughout the treatment, in two the mean systolic blood pressure dropped from this high level, especially during the last half hour, but remained above the initial mean reading, and in one graph the drop in mean systolic pressure was continuous after the second hour and fell below the initial level at the end of treatment. Variations in the mean diastolic pressure were much less in degree and slower in onset. In two graphs the diastolic pressure remained relatively constant, in two there was a rise of from 5 to 13 mm. of mercury, which began two hours after the injection of insulin, and in one the mean diastolic pressure fell gradually during the entire treatment. With a single exception the mean pulse pressure was from 5 to 17 points higher at the end of treatment. Maximal variations in individual consecutive blood pressure readings were as follows: systolic, rise of 60 mm. and fall of 76 mm.; diastolic, rise of 40 and fall of 24 mm. of mercury.

Medical Bull. of Veterans' Adm., Washington, D. C.

16: 1-96 (July) 1939

Sixty Cases of Pneumonia Treated at Whipple from Jan. 1, 1936, to April 1, 1939. J. K. McClintic.—p. 1.
Value of Vitamin C Therapy in Tuberculosis. A. Josewich.—p. 8.
Cholesterol Pleurisy. W. R. Durham and S. Diamond.—p. 12.
Vitamin B_1 in Peripheral Neuritis. A. B. Madden.—p. 16.
Tetanus Toxoid Immunization. C. P. Brown and S. Etris.—p. 25.
Preoperative Diagnosis of Gallbladder Disease. W. M. Bland.—p. 30.
Statistical Study of Heart Diseases. J. A. Reisinger.—p. 33.
Nonclinical Features of Coronary Arteriosclerotic Heart Disease. B. Blumenthal.—p. 45.
Insulin Shock Therapy in Chronic Schizophrenia. P. P. Barker.—p. 53.
Arteriosclerosis of Spinal Cord. A. G. Dumas.—p. 61.
Artificial Dentures for Psychotic Patients. J. H. Poston.—p. 65.

New England Journal of Medicine, Boston

221: 123-162 (July 27) 1939

*Effect of Surgical Operation on Level of Cevitamic Acid in Blood Plasma. C. C. Lund, Boston.—p. 123.
Pathologic Conditions in Biliary Tract. J. E. Pritchard, Montreal.—p. 127.
Kidney Disease. R. Fitz, Boston.—p. 143.

221: 163-208 (Aug. 3) 1939

Encephalitis in Man Caused by Virus of Equine Encephalomyelitis: Report of Case in Adult. J. C. McAdams and J. E. Porter, Fall River, Mass.—p. 163.
Gonococcic Endocarditis, with Recovery after Sulfapyridine: Report of Case. E. S. Orgain and Mary A. Poston, Durham, N. C.—p. 167.
Address on Occasion of First Meeting of Tufts College Medical School Council. B. C. Smith, New York.—p. 169.
Diabetes Mellitus. E. P. Joslin, H. F. Root, Priscilla White and A. Marble, Boston.—p. 173.

Effect of Operations on Blood Ascorbic Acid.—Lund determined the level of ascorbic acid before and after major operations in the blood plasma of forty-three patients. In nearly every case there was a prompt fall after operation from the original level. In a few cases the level began to rise again after four or five days. A low plasma vitamin C value in blood

drawn from a patient immediately after operation may not be so significant an indication of depleted reserves as is a low value before operation. In nine of these forty-three cases the preoperative ascorbic acid level in the plasma was at least 0.8 mg. (normal) per hundred cubic centimeters of plasma, in ten between 0.5 and 0.8 mg. (low normal), in eleven between 0.2 and 0.5 mg. and in thirteen it was less than 0.2 mg. Of patients with normal preoperative levels the vitamin level was reduced postoperatively about 30 per cent on the average and not more than 50 per cent in any individual case within three days after operation. The patients who showed suboptimal but not extremely low preoperative values had an average drop of 50 per cent, and several patients showed a loss of nearly all the vitamin from the blood. In the third group of patients the extremely low original level either persisted or dropped still further. In four cases there was a late rise to a level equal to or higher than the original. In the thirteen cases in which the preoperative values (less than 0.2 mg.) were at the scurvy level the original levels were so low that there could be no appreciable drop. In only two cases was there a late rise in the plasma level.

New Orleans Medical and Surgical Journal

92: 1-60 (July) 1939

Deceased Members of Louisiana State Medical Society: "O Come and Mourn with Me Awhile." S. J. Couvillon, Moreauville, La.—p. 1.
Louisiana Urologists. H. W. E. Walther, New Orleans.—p. 3.
Scleroderma: Dermatologic Aspects. J. K. Howles, New Orleans.—p. 6.
Id.: Etiology and Abnormal Physiology. G. E. Burch, New Orleans.—p. 12.
Id.: Surgical Considerations. A. Ochsner and M. DeBakey, New Orleans.—p. 24.
Preliminary Report on Presumptive Sign of Syphilis. A. L. Adam, Shreveport, La.—p. 30.
Diagnosis and Treatment of Bronchial Asthma. N. K. Edrington, New Orleans.—p. 32.
Torsion of Gallbladder: Report of Case, with Brief Comment on Certain Aspects of This Accident. H. R. Kahle, New Orleans.—p. 37.
Pathologic Fracture of Rib: Report of Case. A. Mayoral, New Orleans.—p. 39.

Physiological Reviews, Baltimore

19: 303-438 (July) 1939

Effects of Extirpations on Higher Brain Processes. C. F. Jacobsen, St. Louis.—p. 303.
Detoxication of Carbocyclic Compounds. L. Young, London, England.—p. 323.
Coenzymes. C. A. Baumann and F. J. Stare, Madison, Wis.—p. 353.
Dental Caries. J. A. Marshall, San Francisco.—p. 389.
Mineral Metabolism of Normal Infants. Genevieve Stearns, Iowa City.—p. 413.

Psychiatric Quarterly, Utica, N. Y.

13: 387-598 (July) 1939. Partial Index

Constitutional Factors in Psychotic Male Homosexuals. H. S. Barahal, Kings Park, N. Y.—p. 391.
Aplastic Anemia Arising During Metrazol Treatment of Schizophrenia: Report of Fatal Case. J. Epstein, New York.—p. 419.
Metabolic Studies of Mental Patients Treated with Insulin Hypoglycemic Shock Treatment: III. Potassium Tolerance Before and After Treatment. M. M. Harris and W. A. Horwitz, New York.—p. 429.
*Bromide Permeability Quotient in Mongolism and Epilepsy. F. A. Mettler, Augusta, Ga.—p. 438.
Psychosis with Syphilitic Meningo-Encephalitis (General Paresis) Eight Months After Chancre. M. Zeifert, Brooklyn.—p. 449.
Syndrome of Acute (Alcoholic) Hallucinosis. G. M. Davidson, New York.—p. 466.
Metrazol Therapy in Manic-Depressive and Involutional Psychoses. M. Zeifert, Brooklyn.—p. 498.
*Theory for Cause of Deaths in Acutely Disturbed Mental Patients. W. A. Thompson, Orangeburg, N. Y.—p. 503.
Psychic Aspects of Bronchial Asthma: Review and Synthesis of Literature. R. B. Sampliner, Utica, N. Y.—p. 521.
Disturbances in Reticulo-Endothelial System During Course of Metrazol Treatment: Report of Three Cases. L. Wender and M. D. Epstein, Hastings-on-Hudson, N. Y.—p. 534.
Statistical Study of 1,140 Dementia Praecox Patients Treated with Metrazol. H. M. Pollock, Albany, N. Y.—p. 558.

Bromide Permeability Quotient in Mongolism and Epilepsy.—Mettler states that the bromide permeability quotient of mongoloids is, as a class, lower than that of normal individuals. Among epileptic individuals the quotient tends to decrease with age while among normal children it tends to increase.

Sudden Death in Mental Patients.—In the 2,038 deaths that occurred at the Rockland State Hospital during a period of seven years, Thompson found forty that were sudden and unexpected. The causes of these forty deaths were assigned to acute exhaustion of the insane. The author shows that these deaths are related or possibly due to dysfunction of the hypothalamus. The observations seem to indicate an irritative lesion of the hypothalamus. This might further suggest that the whole picture of mania (hyperexcitability) can be explained on the basis of pathologic changes of the hypothalamus. This would indicate an organic cause of hyperexcitability and therefore of mania. Future investigation of acute exhaustive deaths should include detailed microscopic observation of this region of the brain. Blood sugar determinations are recommended. The trial of ergotamine tartrate is suggested as treatment for hyperexcitability.

Southern Surgeon, Atlanta, Ga.

5: 269-358 (Aug.) 1939

Thrombophlebitis and Phlebothrombosis. A. Ochsner and M. DeBakey, New Orleans.—p. 269.
Acute Epidural Abscess with Compression of the Cord. G. H. Bunch and L. E. Madden, Columbia, S. C.—p. 291.
Bleeding Peptic Ulcer: Indications for Surgery. F. W. Rankin and C. C. Johnston, Lexington, Ky.—p. 298.
Uterine Displacements. G. G. Ward, New York.—p. 307.
Fractures of Dorsolumbar Spine. J. T. Ellis, T. K. McFatter and S. G. Latiolais, Dothan, Ala.—p. 334.

Southwestern Medicine, El Paso, Texas

23: 205-246 (July) 1939

*Potassium in Allergy. B. Bloom and S. J. Grauman, Tucson, Ariz.—p. 205.
Treatment of Scoliosis with Bone Traction. F. Goodwin, El Paso, Texas, and D. K. Barnes, Hot Springs, N. M.—p. 208.
Recent Advances in Therapy of Pneumonia. F. Kellogg, Long Beach, Calif.—p. 213.
Acute Postinfectious Hemorrhagic Nephritis in Children. W. P. Killingsworth, Port Arthur, Texas.—p. 216.
Diagnosis of Syphilis. J. G. Hutton, Denver.—p. 220.
Enuresis. J. W. Pennington, Phoenix, Ariz.—p. 223.
Treatment of Acute Intestinal Intoxication. E. H. Running, Phoenix, Ariz.—p. 225.

Potassium in Allergy.—Bloom and Grauman find that the symptoms of various diseases (hay fever, pollinosis, chronic sinusitis, asthma, urticaria, eczema, angioneurotic edema and migraine) generally considered to be allergic respond, in many instances, to the oral administration of small doses of potassium salts. There are, likewise, many instances of failure. The authors' intention is only to indicate the types of allergic diseases in which some response has been obtained in order that others may give this method a more extensive trial. There is evidence which lends much support to the concept that electrolytes have a fundamental role in allergy. The authors state that it is impossible at present to say whether electrolyte changes are secondary to the allergic state or whether it is an essential abnormality of electrolyte metabolism that permits the allergic state to develop. That the latter hypothesis is correct seems likely, particularly in view of the food sensitivity cases, in which the expected allergic reaction can be prevented by the preliminary administration of potassium chloride. Should this hypothesis become established it would appear that the proteins, about which practically all the studies in allergy have centered, are significant only as substances which evoke symptoms when the underlying electrolyte mechanisms of the body are altered. It is important to distinguish between the intricate immune mechanisms in the body which come into play after the entrance of a protein allergenic substance and the alterations of electrolyte balance. It is suggested by the authors, as a working hypothesis, that when the electrolyte balance is normal allergic manifestations do not appear. With regard to the contraindications, potassium should not be used in cases of Addison's disease. Potassium might be harmful in some cases of disturbed renal or cardiac function, and perhaps allergic individuals with these complications should not be treated with potassium. So far the authors have had no actual experiences with these complications. In view of a few untoward reactions in asthma they feel that potassium should not be generally used for chronic asthma, particularly for status asthmaticus. In pollen asthma of adults they recommend its use but advise caution. In the treatment of pollinosis of children they advise even greater care until further studies have been made. Side effects occur: occasional mild diuresis, rare diarrhea and slight rhinorrhea, but ordinarily these are not troublesome. Gastrointestinal pain is readily avoided by administering potassium chloride in a dilute aqueous solution, e. g. 10 grains (0.65 Gm.) in a glass of water.

The dosage varies considerably. To some patients with severe hay fever they found it necessary to give 10 grains six times a day. Some of the patients with sinusitis required only 5 grains (0.03 Gm.) three times a day. In other instances such as simple food sensitivity, a single dose of 5 grains may be all that is necessary. The maximal daily dose has been 80 grains (5.2 Gm.).

Virginia Medical Monthly, Richmond

66: 447-512 (Aug.) 1939

The Pathologist Looks at Medicine. F. L. Apperly, Richmond.—p. 447.
Cancer of Breast. J. F. Elward and J. F. Belair, Washington, D. C.—p. 449.
Relation of Degenerative Diseases to Industrial Efficiency. W. K. Vance Jr., Bristol, Tenn.—p. 453.
Eclampsia. H. H. Ware Jr., Richmond.—p. 456.
Medical Jurisprudence: The Medical Witness. A. M. Showalter, Christiansburg.—p. 460.
Diagnostic Methods Which Have Served Me Best in Determining Sinus Disease and So-Called Hay Fever. E. T. Gatewood, Richmond.—p. 465.
Some Practical Considerations of Sinuses. K. S. Blackwell, Richmond.—p. 468.
Hemangioma of Vertebrae. F. H. Smith and L. A. Daoust, Abingdon.—p. 473.
Tests for Peripheral Circulatory Efficiency. N. Bloom, Richmond.—p. 478.
Recent Ideas on Liver Function. H. C. Brownley, Lynchburg.—p. 479.
*One Hundred and Twenty Underweight Cases Treated with Insulin and Diets. J. T. McCastor and Mary Cousins McCastor, New York.—p. 484.
Monocytic Leukemia. A. M. Jacobson, Roanoke.—p. 487.
Metabolism and Therapeutic Uses of Sulfur and Sulfur Compounds. W. A. Moomaw, R. G. Rozier and W. R. Byrum, Richmond.—p. 489.

Insulin and Diets for Underweight.—Since their previous report (abstracted in THE JOURNAL May 21, 1938, p. 1792) of fifteen underweight patients treated with insulin and a high caloric diet the McCastors have continued this practice for 120 additional underweight persons. The procedure was similar to their earlier work with the exception that the initial dose of insulin was as high as 30 units a day in some cases instead of 15 units as in the first fifteen cases. Of the total patients twenty-two did not return for treatment after the first visit when the instructions and plan of treatment were outlined. The psychologic factors are seen here operating at the outset. The patient is unwilling to be convinced that he can gain weight. Many of these patients could be regarded as self-destructive types of individuals. When consciously expressed, the reasons given for this negative attitude were mostly "fear of the needle, fear of the ill effects from insulin." Twelve persons did not return after the second visit and their reasons were not ascertainable. More than 10 pounds (4.5 Kg.) was gained by thirty of the patients, for whom the highest dose of insulin was 90 units daily. Forty patients gained from 5 to 10 pounds (2.2 to 4.5 Kg.) on a daily dosage of 60 units of insulin. In twenty-eight cases the gain in weight was from 1 to 5 pounds (0.5 to 2.2 Kg.) on from 60 to 120 units of insulin daily. The foregoing gains in weight occurred in from a few days up to fifty days. Of two patients who failed to gain much weight, one gained 2 pounds (1 Kg.) in thirteen days on 120 units daily and failed to gain any more, one gained 6 pounds (2.7 Kg.) in thirty-two days and after this no further gain in weight occurred. The authors find that any of the insulins on the market can be used with safety and that when allergic symptoms developed from the use of one insulin a change to another brand or type of insulin usually curtailed the symptoms.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

47: 357-428 (July) 1939

One Stage Abdominoperineal Resection for Carcinoma of Rectum: Report of Sixty-Six Cases. R. A. Scarborough, San Francisco.—p. 357.
Adenoma of Pancreas with Hyperinsulinism: Two Proved Cases in Cousins, with Surgical Cure in One. H. F. West and M. Kahn, Los Angeles.—p. 364.
Acute Pancreatitis. E. E. Larson, Los Angeles.—p. 371.
Advances and Retreats in Neurosurgery. P. G. Flothow, Seattle.—p. 383.
Prognosis of Malignant Papillary Cystic Tumors of Ovary. L. B. Morton, Los Angeles.—p. 393.
Significance of Subcutaneous Scar Tissue. R. E. Mosiman, Seattle.—p. 397.
Method of Proctorrhaphy for Advanced Hemorrhoidal Lesions. Chelsea Eaton, Oakland, Calif.—p. 402.
Bilateral, Nontraumatic Popliteal Aneurysm: Report of Case. A. B. Cooke, Los Angeles.—p. 404.
Diffuse Colloid Goiter. C. A. Hellwig, Wichita, Kan.—p. 406.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

62: 129-226 (June) 1939

Histology of Cerebral Edema Associated with Intracranial Tumors, with Special Reference to Changes in Nerve Fibers of Centrum Ovale. J. G. Greenfield.—p. 129.
*Potassium Content of Muscle in Disease. J. N. Cumings.—p. 153.
Severe Dementia Associated with Bilateral Symmetrical Degeneration of Thalamus. K. Stern.—p. 157.
Neurogenic Hyperthermia: Clinical Syndrome and Its Treatment. T. C. Erickson.—p. 172.
Sensory Innervation of Spinal Accessory and Tongue Musculature in Rhesus Monkey. K. B. Corbin and F. Harrison.—p. 191.
Identity of Myotonia Congenita (Thomsen's Disease), Dystrophia Myotonica (Myotonia Atrophica) and Paramyotonia. O. Maas and A. S. Paterson.—p. 198.
Clinical Investigation of Olfactory Function in Brain Tumor Patients. J. D. Spillane.—p. 213.

Potassium Content of Muscle in Disease.—Cumings records the potassium content found in muscles in a variety of muscular diseases, with special reference to dystrophia myotonica and myasthenia gravis, in which conditions he thinks no similar investigations have been made. The effect of the administration of prostigmine on the muscle potassium has been studied. The content of potassium in affected muscles was normal in cases of progressive muscular atrophy, simple atrophy, Charcot-Marie-Tooth disease, myositis, wasting associated with cerebral tumor and peripheral neuritis. Abnormal muscles containing a low potassium concentration were seen in cases of pseudohypertrophic muscular dystrophy, peroneal atrophy, marked atrophy with fibrous tissue replacement, myopathy with marked fibrosis and myotonia. The muscles in this group of cases contain a large excess of fat or of fibrous tissue. Muscles from two normal subjects, two cases of myotonia and two cases of myasthenia gravis were investigated. Muscles from the normal patients showed no appreciable alteration in potassium content after the administration of prostigmine, but the potassium content of muscles in the cases of myotonia and of myasthenia after prostigmine approached the normal muscle potassium level. Concurrently with the return to a normal potassium level there was a return to normal muscle function in patients with myasthenia gravis. Patients with myotonia showed no clinical improvement as regards either the myotonia or their normal muscular function, although the potassium content approached the normal, and this was not surprising as all the muscles showed some signs of atrophy.

British Journal of Children's Diseases, London

36: 83-170 (April-June) 1939

Tuberculosis Epidemic Caused by Milk-Borne Infection. S. Stähl.—p. 83.
Still's Disease. F. R. B. Atkinson.—p. 100.
Congenital Abnormalities of Gallbladder and Extrahepatic Ducts. E. Stolkind.—p. 113.
Congenital Vesicovaginal Fistula with Imperforate Hymen; Hydrops Factalis and Erythroblastosis; Polydactyly. F. P. Weber and M. Schultz.—p. 131.

British Medical Journal, London

2: 1-50 (July 1) 1939

Importance of Laboratory Effort in Cancer Research. F. G. Hopkins.—p. 1.
Seborrheic Diathesis. J. T. Ingram.—p. 5.
Anthrasilicosis and Bronchial Carcinoma with Quiescent Tuberculosis. J. E. Lovelock.—p. 8.
*Oral Application of Methyl Testosterone and Its Simplification of Androgen Therapy. G. L. Foss.—p. 11.
Sulfapyridine Rashes, with Particular Reference to Acute Exanthems. A. R. Thompson.—p. 13.
Rare Tumor of Tongue, Manifestation of Post Kala-Azar Dermal Leishmaniasis. S. K. Ghosh Dastidar.—p. 14.
Duodenal Ulceration in Newborn. W. Hunter and H. W. Dryerre.—p. 15.

Methyl Testosterone Orally.—Foss found methyl testosterone to be effective when given orally. He states that potency was fully maintained in a postpuberal eunuch with 100 mg. of the preparation daily, and a lower dosage of 50 mg. is effective. All the signs of puberty were produced rapidly in two cases of genital hypoplasia affecting not only sexual but physical development. It is probable that in such cases much smaller doses would be adequate. Methyl testosterone,

10 mg. daily, was given to three patients with dysmenorrhea for whom some relief had been found from injection of testosterone propionate. By two it was taken for fourteen days immediately before menstruation, with no improvement, but the third, taking the methyl testosterone in the middle of the cycle, obtained relief. The eunuch complained of some symptoms such as slight nausea, anorexia and dyspepsia, which were relieved by alkali.

Journal of Mental Science, London

83:615-858 (July) 1939

Physiologic Pathology of Anterior Pituitary. M. Reiss.—p. 619.
Modern Psychiatric Approach to Crime. W. N. East.—p. 649.
Blood Groups in Health and in Mental Disease. J. C. Thomas and E. J. C. Hewitt.—p. 667.
Serum Iso-Agglutinin Titers in Health and in Mental Disease. J. C. Thomas and E. J. C. Hewitt.—p. 689.
Insulin Shock Therapy: I. Carbohydrate Metabolism in Schizophrenia: Preliminary Observations. J. C. Thomas, B. Gibsenan and E. J. C. Hewitt.—p. 696.
*Sterilization Policy, Economic Expediency and Fundamental Inheritance, with Especial Reference to Inheritance of Intelligence Quotient. W. E. Southwick.—p. 707.
Genetics of Phenylpyruvic Oligophrenia: Contribution to Study of Influence of Heredity on Mental Defect. G. A. Jervis.—p. 719.
Choreo-Athetosis and Infracortical Nervous Mechanisms. W. F. Menzies.—p. 783.
Variability Study of Normal and Schizophrenic Occipital Alpha Rhythm: II. Electro-Encephalogram and Imagery Type. M. A. Rubin and L. H. Cohen.—p. 779.
Further Observations on Temporary Treatment. L. Minski.—p. 784.
Blood Pressure in Cardiazol Epilepsy. E. Guttmann and F. Reitmann.—p. 787.
Psychic and Somatic Reactions to Subconvulsive and Convulsive Doses of Triazol. J. B. Dynes and H. Tod.—p. 796.

Sterilization, Economic Expediency and Inheritance.—Southwick studied the social history records of a group of institutionalized patients, each of whom had had one or more children before commitment, while on parole or after discharge. In many cases, data concerning the early environmental conditions, school attainments and intelligence quotients of these children and their parents were recorded. A group of 488 children were located, in 441 of whom records concerning the early environmental conditions were available. On the basis of the precept that any sound sterilization policy should be based on a clearcut demonstration that the germ plasm of the person to be sterilized must be distinctly deleterious to the welfare of society, the intelligence quotients of these 488 children were determined to see whether an "undifferentiated mental deficiency" might be considered to depend on hereditary factors. Of the 441 children whose records concerning the early developmental environment were procured, 15.42 per cent were cared for by parents, grandparents or other relatives, 24.26 per cent had to be cared for at a custodial institution, and the remaining 60.32 per cent were eventually and finally cared for by orphanages, boarding homes or adoption. There were records concerning the school attainments in 114 cases. Of these, 45.61 per cent were patients at an institution for the care of the feebleminded, 36.84 per cent were definitely retarded in their school attainments, 17.54 per cent were in a grade normal for their age and none had attained to a grade in advance of that normal for their age. In order to study more adequately the intelligence quotient distribution of this group of children, all the data concerning the intelligence quotient determinations were presented graphically. In all, there were determinations for 138 children and seventy-two parents (patients). The curves were presented separately and show a smooth, normal distribution in both cases, with modes respectively at 65 and 55 points of intelligence quotient. The continuously variable nature of the intelligence ratings in connection with the nature of the shift of the mode in both of these groups indicates that intelligence is an inherited, continuously variable, quantitative trait, produced by a large number of independently inherited allelomorphic pairs, which, by dint of the large number of combinations possible, produce innumerable quantitative gradations. The group of institutionalized parents would represent a group of allelomorphs that would be predominantly in a homozygous low intelligence quotient condition. Such a concentration of low intelligence quotient genes produces persons who are incapable of caring for themselves. To this extent, such genes are definitely and distinctly deleterious to the welfare of society.

Journal of Neurology and Psychiatry, London

2:193-284 (July) 1939

Hereditamilial Tendinous Areflexia Without Pupillary Changes. L. Van Bogaert.—p. 193.
Effect of Fructose Ingestion on Blood Fructose in Psychotic Patients. W. M. F. Robertson and T. M. Wilson.—p. 203.
Study of Effect of Right Frontal Lobectomy on Intelligence and Temperament. T. Lidz.—p. 211.
Reaction of Pial Arteries to Some Choline-like and Adrenalin-like Substances. V. Lunn and M. Fog.—p. 223.
Increased Spontaneous Activity and Food Intake Produced in Rats by Removal of Frontal Poles of the Brain. C. P. Richter and C. D. Hawkes.—p. 231.
Somatic Research in Periodic Catatonia. A. B. Stokes.—p. 243.

Lancet, London

2:1-60 (July 1) 1939

Mechanism of Diabetes Mellitus. H. P. Himsworth.—p. 1.
*New Serum in Passive Control of Scarlet Fever. D. B. Bradshaw.—p. 6.
Etiology of Polyarthritis in Rat. G. M. Findlay, R. D. Mackenzie, F. O. MacCallum and Emmy Klienebergerr.—p. 7.
*Bacteriostatic Action of Sulfanilamide in Vitro: Influence of Fractions Isolated from Hemolytic Streptococci. T. C. Stamp.—p. 10.
Disturbance of Memory After Convulsion Treatment. G. Tooth and J. M. Blackburn.—p. 17.
Paget's Quiet Necrosis. J. C. R. Hindenach.—p. 20.

Passive Control of Scarlet Fever.—According to Bradshaw a new scarlet fever antitoxin was tried in the wards of a children's hospital as a means of passive prophylaxis. The scarlet fever antitoxin, according to the makers, is refined and concentrated by a process of "selective and controlled digestion of the inactive, reaction-producing proteins by means of proteolytic enzymes." Most Dick positive patients received their serum within a few hours of admission and virtually all within twenty-four hours. From July 27, 1937, to Aug. 4, 1938, 658 patients received the serum. During the course of the trial, one case of scarlet fever developed in the ward. The child had been in the ward forty-eight hours before the serum was administered, and signs of scarlet fever appeared within a few hours of the injection. The serum has also been employed in the control of scarlet fever in the general medical and surgical wards. During the period under review there have been fourteen primary cases of scarlet fever in the general wards, involving 135 Dick positive contacts. They were dealt with as the cases in the children's wards. No secondary cases of scarlet fever developed. Of the total of 793 patients receiving serum, only ten had serum reactions.

Bacteriostatic Action of Sulfanilamide in Vitro.—Stamp records results of experiments which indicate that it is possible to isolate from broth cultures of group C hemolytic streptococci a substance capable of antagonizing the bacteriostatic action of sulfanilamide and sulfapyridine in different mediums. The substance may be extracted from the bacterial cells by means of dilute ammonium hydroxide but is not removed in appreciable amounts by extraction with water or dilute hydrochloric acid. The activity of the substance is not affected by heating to 100 C. and does not appear to be highly specific, since it produces a growth-promoting effect in the presence of the drugs not only on the homologous strain but also on a strain belonging to a different serologic group. The substance is active in low concentrations under favorable conditions exerting an appreciable effect in a dilution of 1:1,000,000, while a marked effect has been obtained in nearly all experiments in a concentration of 1:10,000. Chemical analysis indicates that the substance consists of material of relatively low molecular weight and is free from protein. Further purification and analysis of the active substance must be carried out before any definite indication can be obtained as to its real chemical nature and the way it produces its antibacteriostatic effect. The active fraction may contain a necessary nutritive factor, possibly an essential amino acid the production of which is interfered with by the action of the drugs. It may be one of the rarer amino acids which the organisms have to synthesize or it may even consist of a more complex molecule necessary for the synthesis of bacterial protein. There is the further possibility that the active substance is an essential part of the enzyme system affected by the drugs. It may be that the activity of the drugs is directed not against an actual enzyme but rather against a substance of the nature of a coenzyme on the presence of which in many cases the activity

of enzymes has been shown to be entirely dependent. The presence of such a substance in the active fraction might therefore be responsible for the effects produced. An apparently similar fraction has also been isolated from a culture of a group A hemolytic streptococcus.

Medical Journal of Australia, Sydney

1: 885-918 (June 17) 1939

Research in Medicine. J. H. L. Cumpston.—p. 885.
Etiology and Prevention of Blood Transfusion Reactions: Safe and Simple Blood Transfusion Apparatus for General Use. N. J. Bonnin. —p. 888.
Differential Diagnosis of Internal Derangement of Knee Joint. N. Little. —p. 895.
Type of Hemolytic Streptococci Occurring in Outbreak of Puerperal Sepsis: Note. Lucy M. Bryce.—p. 900.

1: 919-944 (June 24) 1939

Some Observations on Treatment of Mental Disease. D. M. McWhae. —p. 919.
Recent Work in Study of Epilepsy. G. Phillips.—p. 922.
*Three-Dye Treatment of Burns. J. B. Devine.—p. 924.
The First Australian Health Officer. W. G. Armstrong.—p. 928.
Congestive Heart Failure in Later Months of Pregnancy. S. D. Meares. —p. 929.
Blood Groups in Queensland. N. R. Henry.—p. 932.

2: 1-50 (July 1) 1939

History of Medical Journalism in Australia. J. H. L. Cumpston.— p. 1.
Changed Outlook in Medicine During Last Twenty-Five Years. C. B. Blackburn.—p. 5.
Changed Outlook in Surgery. H. Newland.—p. 8.
Twenty-Five Years of Preventive Medicine in Australia. F. S. Hone. —p. 12.
Twenty-Five Years of Progress in Medical Research. C. H. Kellaway. —p. 16.
Changes of Twenty-Five Years in Outlook on Infectious Disease. F. M. Burnet.—p. 23.

Three-Dye Treatment of Burns.—Devine describes a three-dye method of treating burns and scalds, which is of particular value for industrial and military first aid purposes, because it at once substantially relieves pain and commences a treatment which will be carried on in the hospital. In twenty-seven cases the three-dye method of treatment was used and in ten the tannic acid or tannic acid and flavine method. Included in this series were patients from the bush fire areas. The three-dye mixture consists of a 1 per cent aqueous solution of gentian violet and of brilliant green, and a 0.1 per cent solution of neutral acriflavine. The mixture is quite stable and can be kept for any length of time. The three-dye mixture is swabbed over the burnt area and no dressing is applied. No attempt is made to "clean up" the burnt area. Trauma with a nail brush or friction of any sort would be expected merely to force infected material from the surface through the coagulated area. It is inconceivable that scrubbing would serve to sterilize the area. When a large area of skin is involved, a preliminary injection of morphine may sometimes be necessary to relieve pain centrally. When the area of the burn is not great, the local relief of pain afforded by the use of the dye is generally sufficient. Blisters on the burnt area are snipped and the dead skin is removed, and the burnt area is dabbed, painted or sprayed with the three-dye mixture. A second application after about half an hour is usually given but is not always necessary. Tanning commences immediately. The tan formed is not so thick as that produced by tannic acid and it is more flexible. Delayed blisters appearing within a few days after the burn require snipping and removal of dead skin and a reapplication of the dyes. No dressings are used. Clothing is so arranged by outpatients that as far as possible no pressure is applied to the burnt area and, with the same end in view, hospitalized patients are put into suitable postures and covered with cradles. Patients with minor burns merely require an occasional observation to see whether any softening of the eschar has occurred. Patients with more extensive burns require careful and continuous treatment. During the process of epithelization care must be taken, by the use of splints, to prevent contractures due to scarring. Death in the early stages is nearly always due to shock, and 80 per cent of deaths occur in the first two days. After a week the main cause of death is bronchopneumonia. With a view to the prevention of bronchopneumonia, some of the patients were allowed up early and encouraged to exercise as much as possible. In the thirty-seven cases there were two deaths, occurring in men who had been burnt by and had inhaled acetic anhydride; one was treated by the three-dye method and the other by the tannic acid and flavine method. Both died within two days. Of the twenty-seven patients treated by the three-dye method, none became obviously infected, one doubtfully. Of the ten patients treated by tannic acid or tannic acid and flavine, four showed infection. There appeared to be no difference between the amount of shock experienced after tanning by the patients who were treated by the tannic acid and those treated by the three-dye method. The advantages of the three-dye method of treatment that the author lists are: 1. The mixture is inexpensive and keeps indefinitely, and therefore it is always on hand for emergencies. 2. The mixture forms a coagulum rapidly and with only one or two applications, and the coagulum when formed is more pliable than that formed by tannic acid. 3. As a result of the analgesic action of the gentian violet, pain is alleviated rapidly. 4. The mixture appears to be more efficient in preventing infection than tannic acid. The two disadvantages of the method are that the mixture stains clothing and linen and in very small children and babies the coagulum formed may be too thick and it may crack at the edges.

Proceedings of Royal Society of Medicine, London

33: 853-1022 (June) 1939. Partial Index

British Prisoners Released by Napoleon at Jenner's Request. J. A. Nixon.—p. 877.
Swallowed Foreign Bodies. A. H. M. Siddons.—p. 885.
*Serum and Vaccine Therapy in Combination with Sulfanilamide or Sulfapyridine. A. Fleming.—p. 911.
Elimination of Breach Presentation from Private Practice. G. F. Abercrombie.—p. 930.
Epidemiology of Jaundice. E. R. Cullinan.—p. 933.
Significance of Anorexia in Modern Psychiatric Treatment. J. H. Quastel.—p. 951.
Coma Resistance and Adrenalemia in Insulin Treatment of Schizophrenia. M. S. Jones.—p. 958.
Treatment of Incompletely Descended Testis. D. S. P. Wilson.—p. 969.

Serum and Vaccine Therapy with Sulfanilamide or Sulfapyridine.—Fleming states that even with the most sensitive organisms sulfanilamide and sulfapyridine do not effect a cure in every case, and he offers evidence to show that the results obtained by increasing the power of the defensive mechanism, in other words, by increasing the immunity, are, in combination with these drugs, far superior to immunotherapy or chemotherapy alone. The immunity can be increased specifically by vaccine and serums and nonspecifically by a great variety of measures. He states that there is as yet no published work on the combination of serum therapy and sulfapyridine, but he shows in vitro that the addition of antipneumococcus serum greatly enhances the antipneumococcic power of a mixture of human blood and sulfapyridine. In his studies the combination of immune serum and sulfapyridine was the only one effective in preventing the growth of pneumococci in human blood and he has little doubt that the same combination will be most effective in the treatment of pneumonia in man. However, when the leukocytes are removed from the blood the combination of sulfapyridine and immune serum is without effect. Others have put forth evidence that the state of immunity of the patient plays a large part in the success or failure of sulfanilamide treatment. This clinical evidence is not conclusive, but he believes that it is significant when taken in conjunction with the experimental evidence that he presents. He sums up the new chemotherapy by sulfanilamide and sulfapyridine. These drugs act on certain sensitive bacteria in some way so that the mechanism of the body completes the task by destroying the bacteria. The result, therefore, which will be obtained in any particular case will depend on the sensitiveness of the infecting organism to the drug and the immunity of the patient. The ordinary individual may, as far as the common pyogenic organisms are concerned, be regarded as having a medium degree of immunity which can be increased actively or passively. In an acute case one cannot tell whether the infecting organism is one which is sensitive to these drugs so that, if the patient is to have the best chance, every endeavor should be made at the same time that the drug is administered to increase the patient's immunity by vaccines or serums or by nonspecific measures. Serums are obtainable only for certain infections, but vaccines can be obtained, or can be prepared readily, for almost every acute bacterial infection.

Annales d'Endocrinologie, Paris

1: 129-240 (May) 1939

Glomic Vessels of Hypophysis and of Cavernous Sinus in Guinea Pigs. R. Collin.—p. 129.
*Secondary Tetany in Hyperfolliculinemia. G. Marañon, C. Richet, A. Pergola and G. Lesueur.—p. 142.
Tetany in Adults and Persistence of Thymus. R. Leroux, G. Marañon, C. Richet and A. Pergola.—p. 152.
Hypophysial Gonadotropic Hormonotherapy. S. Aschheim, L. Portes and M. Mayer.—p. 164.

Secondary Tetany in Hyperestrogenemia.—Marañon and his associates point out that although the pathogenesis of tetany has been rightfully dominated by the notion of hypoparathyroidism, there are nevertheless other endocrine factors, distinct from the parathyroids, which may intervene in the genesis of tetany. Clinical observations which were published recently by Sergent and Mamou directed attention to the influence of genital hormones in the pathogenesis of certain types of tetany. Marañon and his collaborators describe four cases of tetany in which the genital hormones played a part. The first one concerned a young woman with probable spasmophilia or latent tetany and dysovarism of the hyperestrogenemic type; an injection of estrogen, by accident intravenous, produced an intense and typical attack of tetany. The second case concerned a cryptorchid, half castrated man with evident genital insufficiency, who had latent tetany with spontaneous paroxystic crises. His feminoid character coincided with an abnormal secretion of estrogen. Considerable improvement was obtained by treatment with testicular hormone. The third patient was a man with cholecystitis, psoriasis, arthropathy, chronic tetany and old orchitis and hypogenitalism. Examination disclosed considerable estrogenuria. Treatment with testicular hormone counteracted the symptoms of tetany. The fourth patient was a woman with dysovarism due to excess of estrogen and with symptoms of premenstrual tetany. The administration of luteinic substances and of testosterone produced a favorable therapeutic effect. As the most likely explanation of this relation between genital function and tetany, the authors regard the hypothesis that in women there exists an absolute or relative hypersecretion of estrogen or a diminution of the luteinic hormone and in men there exists considerable estrogenuria and doubtlessly diminution of the testicular hormone.

Archives des Maladies de l'Appareil Digestif, Paris

29: 577-696 (June) 1939

*Spondylomalacia in Biliary Cirrhosis. M. Loeper, A. Lemaire, and R. Lenobre.—p. 577.
Buccogingival Infections of Intestinal Origin. E. Antoine.—p. 588.
Hyperglycemic Shock. K. Glaessner.—p. 615.
Amelioration of Coefficient of Assimilation in Diabetic Patients Apart from Insulin. I. Radvan.—p. 624.
Histophysiologic Examinations on Anti-Inflammatory Effect of Astringents. G. Wallbach.—p. 636.

Spondylomalacia in Biliary Cirrhosis.—Loeper and his associates report the clinical history of a woman aged 69 who had a chronic progressive melanodermic and icterogenic hepatitis without pancreatic symptoms and without calculi. The disorder was complicated by malacic lesions of the vertebrae. The diagnosis proved difficult at first. The icterus by retention was for a long time too evident and too prolonged to permit the diagnosis of biliary cirrhosis. The history was rather that of a calculous cirrhosis, but there was neither choledochal obliteration nor vesical lithiasis. The obstruction of an intrahepatic biliary canal, although possible, escaped the authors in the anatomic examination. They diagnosed the disorder as chronic icterogenic fibrous hepatitis. The osseous lesions involving the lumbar vertebrae attracted special attention. After citing osseous changes described by others in the course of biliary cirrhosis, the authors show that the osseous changes in the reported case differ from those described in the literature. They became manifest suddenly by acute pain in the lumbar region, and vertebral osteoporosis was discovered by radiography in a woman who had been icteric for many months. The calcemia was increased. The pains and the calcification were counteracted by the combined treatment with intravenous injections of calcium gluconate and the oral administration of irradiated ergosterol. The necropsy finally revealed a hyperplasia of the parathyroid tissue. This physiopathologic connection is common in senile osteoporosis and in osteomalacia caused by deficiency. Its relation to chronic icterus raises interesting discussions. The authors show that investigation on the calcium metabolism in patients with icterus have produced divergent conclusions but that the literature contains reports about osseous decalcifications and osteoporosis in the course of prolonged icterus. Moreover, they cite animal experiments in which prolonged ligation of the choledochus resulted in a diminution of the calcium content of the blood and in osseous rarefaction. On the other hand, decalcification is frequently observed in patients and animals with biliary fistula. It is striking that the osseous disturbances observed in the reported case are on the whole identical with those engendered by the derivation of the bile from the intestine. After citing clinical and experimental evidence to this effect, the authors point out that the decalcification after biliary fistulization is explained by the fact that the suppression of the bile in the intestine prevents the assimilation of fats and of liposoluble vitamins. The lime soaps precipitate and are not absorbed in the alkaline milieu and in the absence of biliary salts. The authors think that such a calcium and vitamin deficiency can well be invoked in the described case because the conditions of the intestinal assimilation of fats were the same as after exclusion of the biliary passages. Not only does the spondylomalacia recall osteopathy due to insufficiency but the physiopathologic mechanism seems likewise identical. The authors point out that a knowledge of these facts enabled Leriche to treat osteomalacia resulting from choledochal drainage by means of osseous grafts and parathyroidectomy and that they themselves obtained favorable results by recalcification with calcium and irradiated ergosterol.

Archives des Maladies du Cœur, Paris

33: 545-656 (June) 1939

Vasoconstrictive Substances in Blood of Dog with Hypertension Induced by Section of Vasomotor Nerves. H. Hermann, F. Jourdan and A. Detrieu.—p. 545.
Lowering of Diastolic Auscultatory Tension Index in Hyperextension of Forearm. G. Giraud and Jean-Marie Bert.—p. 556.
Fever and Paroxysmal Tachycardias. C. Lian, J. Facquet and Brauerman.—p. 566.
Varied Rhythm Disorders in Myocardial Infarction: Case. E. Donnelot, A. Meyer-Haine and M. Pelaez.—p. 573.
Abdominal Angina with Vasomotor Disturbances and Episodic Ventricular Tachycardia Secondary to Apoplexy of Large Fibrous Scar Plaque. J. Delarue and J. Fleury.—p. 581.
*Auriculoventricular Dissociations in Typhoid. R. Godel and E. H. Stéphan.—p. 589.

Auriculoventricular Dissociation in Typhoid.—Godel and Stéphan report three cases of auriculoventricular dissociation clinically and electrocardiographically observed during the course of typhoid. Standard three lead tracings were made during fever and in defervescence. Electrocardiac tracings made at the end of the first week of the first patient (aged 18 years) revealed enlargement of the PR interval, low voltage in the auriculoventricular complexes in lead 1 and flattening of the T wave in all three leads. The second electrocardiogram taken at the end of the second week disclosed the same enlargement of the PR interval and indications of dissociation in lead 3, sinus rhythm remaining regular at about 90. Digitalin administered for a presystolic murmur during the middle of the second week had, as electrocardiac observation showed, no effect on dissociation, since disturbances of the conduction tract preceded it and regressed despite continual dosage; the PR interval likewise remained the same, though 75 drops of digitalin was given during convalescence. The patient was observed repeatedly after release from the hospital. No traces of cardiac disease were detected. Cardiograms taken of the second patient (aged 15 years) disclosed an enlarged S wave and an exaggerated, slightly diphasic, amplitude of the T wave in leads 1 and 2. In defervescence, auriculoventricular disturbances appeared, when amphibolic oscillations fluctuated between normal temperature in the morning and 104 F. in the evening, while the PR interval, regular during the course of the fever, began to lengthen and pass rapidly from 0.12 second to 0.16 to 0.20 second of time and the ST segment dipped below the iso-electric level. The T wave was less ample in lead 1 and negative in leads 2 and 3. Electrocardiac tracings made at the end of the defervescence period revealed dissociation and other indications of sinus arrhythmia in

lead 3. Convalescence was normal with normality reestablished in the PR interval. The history of the third patient (aged 12 years) disclosed dissociation not in conformity with classic heart block. Electrical readings first made with temperature at 104 F. indicated large amplitude of the auricular peak with marked diphasis in leads 1 and 2, progressive lengthening with subsequent shortening of the PR interval and the T wave tending to flatten out and disappear completely in lead 2. Defervescence was marked by arrhythmia of a pronounced type. The irregularity of the sinus rhythm was so great that no two successive equidistant PP intervals were discoverable in lead 1. Ventricular followed auricular complexes at distances of from 0.24 to 0.32 second, at times completely merging with the auricular complex or anticipating it. Two independent rhythms established themselves, the idioventricular rhythm consistently regular at forty-five a minute. Tracings showed complete dissociation with the ventricular rhythm regular, the auricular less regular and slower. With increased temperature stabilization, sinus rhythm was accelerated and auriculoventricular sequences became increasingly numerous. Tracings made during a relapse that lasted about two weeks revealed regular rhythm and normal auriculoventricular relations in the three leads. However, on the third day of defervescence slight sinus arrhythmia was traced in lead 1. Significant bradyarrhythmia accompanied convalescence. Electrocardiograms revealed the same sinus disturbances and phenomena of dissociation as before the relapse. After eight days auriculoventricular action was restored to normal condition. The authors point out the indications of this atypical dissociation. According to their analysis, disorders of the conductive tract do not necessarily imply myocardial toxinfections but may be due to extracardiac pathogenesis. Disorders of the sympathetic nerve system may well extend to the conductive system and induce vagotonia. Prognosis of cardiac disturbances secondary to vagal hyperfunction is ordinarily benign.

Presse Médicale, Paris

47: 1077-1100 (July 8) 1939. Partial Index

Asthma and Syndrome of Löffler. F. Besançon, A. Jacquelin, F. Joly and J.-D. Moncharmont.—p. 1077.
Cutaneous Amebiasis. A. Touraine and R. Duperrat.—p. 1086.
*New Method of Roentgenologic Study of Colon: Serial Roentgenograms. J. Rachet and J. Arnous.—p. 1093.
Origin of Histiocytes and Phenomenon of Bittorf in Course of Septic Endocarditis. O. Bybova.—p. 1097.

Serial Roentgenograms of Colon.—Rachet and Arnous criticize the present methods of roentgenologic examination of the colon, particularly the ordinary barium sulfate enema, and show that the imperfections of these methods make it necessary to accept the diagnoses made with them with great caution and reservation. Serial roentgenography, as employed for gastroduodenal examination, provides a maximum of precision in the differentiation of organic and functional images. In comparing several roentgenograms that are taken during peristaltic contractions, two types of deformities of the intestinal walls can be visualized, those which are modified by the peristalsis and those which are not, the first ones being functional and the second ones organic. The authors raise the question why this method of serial roentgenoscopy is not employed for the examination of the colon. Since the rare and slight character of the colonic movements is probably the cause of the rejection of this method, they show that this problem can be solved by the artifical production of peristaltic contractions. In preparing the patient for the serial roentgenograms of the colon, they avoid all laxatives and purgative enemas. The evening before, the patient is given a large enema of salt water (1.5 per cent); in the morning, an hour before the examination, the same type of enema is given and if this does not return absolutely clean a third enema, consisting of 200 cc. of lukewarm water, is given immediately before the examination. As the precautions which are indispensable for obtaining clear roentgenograms, the authors stress the following: 1. The contrast enema must be homogeneous, because the presence of barium conglomerates may distort the interpretation. 2. The temperature of liquid should be 37 C. (98.6 F.), for if the enema is too cold it may elicit a colic chill. 3. The pressure of the enema should be as low as possible. 4. By means of a final insufflation, the walls are distended. In order to stimulate peristalsis, the authors employ the subcutaneous injection of prostigmine, but they think that the same end can be obtained with other substances, for instance the posterior lobe of the hypophysis. The serial roentgenograms, from five to eight in number, are taken at regular intervals, usually every ten minutes. The authors report a number of illustrative cases. They admit that serial roentgenoscopy applied to the colon is still under investigation and that, like all new methods, it requires improvement. They think that it advances the precision of the diagnosis in three ways: the estimation of the extension of the lesions, the estimation of the operability of a tumor and perhaps also the determination of the nature of the lesion.

Revue Neurologique, Paris

72: 673-808 (June) 1939

Clonic Spasms in Muscles Innervated by External Popliteal Sciatic Nerve: Case. A. Sonques.—p. 673.
Inflammatory Sclerosis of White Matter of the Hemispheres: Case. L. Van Bogaert and J. de Busscher.—p. 679.
*Arterial Retinal Tension in Intracranial Tumors: Its Importance for Topographic Diagnosis and Its Role in Formation of Choked Disk. G. de Morsier, M. Monnier and E. B. Streiff.—p. 702.

Arterial Retinal Tension in Intracranial Tumors.—De Morsier and his co-workers review the evidence of twenty-one cases of intracranial tumors, verified as such surgically or at necropsy, in order to determine the significance of cerebral tumors for retinal and spinal tension and the formation of choked disk. The age of the patients ranged between 11 and 60 years. The authors established two indexes: a retinohumoral tension index, obtained by dividing the normal diastolic retinal tension by the normal diastolic humoral tension of the twenty-one patients, and a retinospinal tension index, ascertained by dividing the retinal tension by the spinal tension. Methods of measurement and arithmetical results are indicated. They found (1) that, contrary to accepted views, intracranial tumors were accompanied much more frequently by retinal hypotension or normal retinal tension than by retinal hypertension (only six of the twenty-one [28 per cent] had retinohumoral hypertension, twelve had hypotension, and three were normal); (2) that the retinohumoral tension index unmistakably indicated variations according to the site of the cranial tumor, with greater retinal hypertension accompanying tumors in the posterior cerebral fossa (two cases adverse). From these observations the authors deduce that other factors besides brain compression are productive of retinal hypertension (frequently observed, e. g. in sequels of craniocerebral traumas). Retinal tension may well be conditioned by disturbances in the control centers of cerebral vasomotricity. In their study of retinospinal tension in relation to choked disk the authors were led to formulate the following observations: 1. The retinospinal tension index is not affected by the position of the tumor. 2. A certain connection exists between spinal tension and choked disk formation, papilledema invariably arising when spinal tension rose to 80 or higher but capable of developing with spinal tension as low as 40. 3. Choked disk appeared (with two exceptions) when the retinospinal tension index fell below 0.58 (below half the normal rate of about 1.2). The authors think that these observations, which they admit need to be studied more extensively, have interpretative significance for noncerebral tumors. They point out that choked disk is much less frequent in intracranial tumors than is generally assumed. The low frequency (eight times in twenty-one cases, or 38 per cent) is ascribed by them to the regular employment of encephalography.

Schweizerische medizinische Wochenschrift, Basel

69: 677-696 (July 29) 1939. Partial Index

Vitamin C Requirements of Children. W. Tolder.—p. 677.
Blood Transfusion in War Surgery. P. Regidor.—p. 682.
*Lambliasis as Possible Cause of Cancer in Biliary Passages. J. W. Grott.—p. 683.
New Chemotherapeutic (Sulfanilamidopyridine) in Human Brucellosis. H. Schober.—p. 685.

Lambliasis and Cancer of Biliary Passages.—Grott says that different parasites harbored by the human organism may be factors in the development of neoplasms either because of their continuous irritating action or because of their metabolic products. In the course of studies on lambliasis of the biliary passages he observed three carriers of Lamblia intestinalis who also had cancer of the biliary passages. After reporting the clinical histories of these patients, he emphasizes that these

observations and reports in the literature convinced him that, in case of cancer of the biliary passages, lambliasis must be taken into consideration as a possible causal factor. Moreover, lambliasis should be searched for in all intestinal diseases of obscure etiology. If lambliasis has been established, it is necessary to keep the patient under careful control until complete cure has been established in order to prevent the carrier of the parasites from becoming a further source of infection. This is the more justified since lambliasis can be effectively treated with preparations of the acridine group, such as atabrine.

Annali Italiani di Chirurgia, Bologna

18: 455-558 (June) 1939. Partial Index

Extramedullary Intradural Tumors: Clinical Study. F. Capella.—p. 455.

*McClure and Aldrich Test in Relation to Surgical Intervention in Chronic Appendicitis. P. Gagliardi.—p. 517.

McClure and Aldrich Test in Appendicitis.—Gagliardi followed the behavior of the McClure and Aldrich test (intradermal injection of sodium chloride solution) in relation to a surgical intervention in forty cases of various inflammatory and noninflammatory diseases, especially chronic appendicitis. The test was carried out in twenty cases some days after the operation and in nineteen cases some days before and some days after the operation. In all cases the test was carried out according to the original technic. Determinations of the arterial pressure were also carried out in the group. The author found that the results of the test and the duration of the wheal are not in relation to the sex of the patients, the nature (either inflammatory or noninflammatory) of the disease, the presence of preedema and the variations of the arterial pressure. In cases of inflammatory disease the results of the test are in relation to the operation. The reaction of the second test is more intense and lasting than that of the first one. In some cases in the group an erythematous reaction around the wheal developed both after the first test and after the second one. According to the author the reaction is a reaction of the skin to the injected sodium chloride solution, in the production of which vascular (cutaneous capillaries), constitutional and other nonidentifiable factors are present. The occurrence of an erythematous reaction in many cases shows that the reaction is a local reaction of the skin. The reaction is of a defensive nature. The increased intensity of the reaction after the operation (as compared with the results of the test before the operation) show that the organic forces of defense (which previous to the operation were divided between the pathologic local focus and the local reaction of the skin) are entirely diverted to the skin after removal of the pathologic focus.

Rivista di Clinica Pediatrica, Florence

37: 577-672 (July) 1939. Partial Index

*Antitoxic Action of Ascorbic Acid and of Extracts of Adrenal Cortex in Experimental Diphtheria. A. Galeotti Flori.—p. 577.

Vitamin C and Abdominal Purpura of Schoenlein-Henoch's Type. F. Capello.—p. 587.

Ascorbic Acid and Adrenal Cortex Extract in Diphtheria.—Galeotti Flori found, by means of experiments, that ascorbic acid alone or in association with adrenal cortex extract has an antitoxic action on diphtheria toxin in vitro. The action depends on the duration of the contact between the acid and the toxin and also on the amount of toxin in the ascorbic acid-diphtheria toxin mixture. Ascorbic acid alone, or in association with adrenal cortex extract, as well as the adrenal extract alone, has an antitoxic action on diphtheria toxin in living animals, provided the dose of the toxin administered is smaller than the minimal mortal dose. Otherwise the toxin is not neutralized. Ascorbic acid administered separately during antiserum treatment does not increase the effects of antiserum in the course of experimental diphtheria. The author concludes that, although experimental results cannot be applied to the clinical field as a whole, his results show that ascorbic acid alone or in association with adrenal cortex extract is not a substitute for diphtheria antiserum, which is the proper treatment of diphtheria. However, either ascorbic acid or adrenal cortex extract can be used as a coadjuvant to antiserum.

Chirurg, Berlin

11: 537-576 (Aug. 1) 1939

*Rib Fractures with Typical Localization Caused by Overwork. H. G. Matthes and A. Thelen.—p. 537.

Vaccination Against Tetanus. H. Hornung.—p. 543.

Origin and Development of Epidermal Tumors. A. Lautenschläger.—p. 545.

Differential Diagnosis of Calcified Meniscus. T. Ech.—p. 547.

Rib Fractures.—From Kirschner's clinic at Heidelberg, Matthes and Thelen report four cases of rib fracture in which the etiologic factor was muscular overwork. All four patients were young men in good general health who for a short time (from two to five weeks) preceding the disability were performing heavy muscular work to which they were unaccustomed. The fractures involved the second or the second and third ribs at their costocartilaginous junction. The authors consider the mechanism to be uncoordinated, exaggerated pull over a period of time of the insertions of the pectoralis minor and the upper portion of the trapezius muscle. The diagnosis of the condition may be arrived at from consideration of the history and the appearance on the seventh to fourteenth day of a moderately painful swelling at the typical localization and on the presence of pain caused by movements of the shoulder girdle, particularly when the pectoralis minor and the upper portion of the trapezius are brought into action. A roentgenogram is of little value because the fracture is through the cartilaginous portion of the rib. The treatment consists of rest, of local anesthesia of the fractured area in cases of severe pain and later of diathermy and motion. After four weeks of treatment, patients are recommended for a lighter occupation.

Klinische Wochenschrift, Berlin

18: 869-900 (June 24) 1939. Partial Index

Vitamin B1 Economy in Adults. F. Widenhauer and G. Wieland.—p. 873.

*Occurrence and Extent of Real Deficiency of Vitamin A. W. von Drigalski, H. Kunz and K. Schlüpmann.—p. 875.

Clinical Aspects and Therapy of Postdiphtheric Paralysis. F. Hansen.—p. 877.

Cerebral Circulation. K. Weidner.—p. 882.

Applicability of Pyrethrum as Anthelmintic. A. Jores and H. Wolter.—p. 885.

New Method of Alkali Neutralization of Skin. F. Koch.—p. 889.

Deficiency of Vitamin A.—Von Drigalski and his associates say that, in view of the difficulties which are encountered in the demonstration of vitamin A in the blood, it has been deemed advisable to search for vitamin deficiencies and to estimate, from the quantities of vitamin that are required to counteract them, the adequacy of the supply of vitamin A. Since the disturbance of the adaptation capacity of the eye, that is, the "night blindness due to vitamin A deficiency," is an easily detectable early symptom of the deficiency of vitamin A, it has been investigated by many workers. After reviewing the results obtained by some investigators in healthy persons and in patients and after pointing out that the vitamin A metabolism in pregnant women deserves especial attention, the author describes his own studies on the adaptation capacity of the eye in fifty healthy adults, ninety pregnant women (most of them in their eighth or ninth month of pregnancy), thirteen nursing mothers and fifty patients. The tests were made with a five point adaptometer of Birch-Hirschfeld. Summarizing the results of his adaptometric studies, he says that among the fifty healthy adults he observed three mild cases of deficient dark adaptation indicative of an insufficiency of vitamin A; among the fifty patients, twelve cases of medium severity and three severe cases; among the ninety pregnant women, eleven cases of moderate severity and four severe cases, and among the thirteen nursing mothers, three mild cases. By continuous control examinations on persons treated with vitamin A, the author was able to obtain definite figures on the vitamin A deficiencies. The deficits varied between 72,000 and more than 300,000 international units of vitamin A, corresponding to between 43 and 200 mg. of beta-carotene. He discusses the role of nutrition in the causation of vitamin A deficiency and gives especial attention to the increased requirements of pregnant women and nursing mothers. He shows that there is a wide span between the minimal and optimal vitamin A supply.

Medizinische Welt, Berlin

13: 1011-1044 (July 22) 1939. Partial Index

Old and New Aspects of Problem of Otosclerosis. O. Voss.—p. 1011.
Local Anesthesia of General Practitioner. F. F. Härtel.—p. 1016.
*Superiority of Fluorescence Microscopy in Demonstration of Tubercle Bacilli: Comparative Studies on 1,000 Specimens of Sputum. P. Weiler and O. Kunz.—p. 1019.
Early Treatment of Male Gonorrhea with Uliron (Sulfanilamide). H. J. Barnewitz.—p. 1021.

Fluorescence Microscopy in Demonstration of Tubercle Bacilli.—According to Weiler and Kunz, several investigators have found that, in the demonstration of tubercle bacilli, Hagemann's method of fluorescence microscopy (abstracted in THE JOURNAL June 5, 1937, p. 2006, and July 17, 1937, p. 243) produces much better results than the methods of Ehrlich-Ziehl-Neelsen or of Konrich. Dabelstein, however, saw no advantage in Hagemann's method. In order to eliminate autosuggestive factors, which might have had some influence in previous investigations, in which the comparative tests had been made by the same person, the authors decided to conduct their tests independently. Kunz examined the specimens of sputum according to Konrich's technic and Weiler according to Hagemann's fluorescence microscopy. They studied 1,000 specimens in all and a subsequent comparison of the results disclosed a decided superiority of Hagemann's fluorescence microscopy. It yielded 26 per cent positive results, whereas Konrich's method produced only 9.1 per cent positive results. Another advantage of fluorescence microscopy is that it saves time. Moreover, in the differential diagnosis between tubercle bacilli and saprophytic acid-fast rods, fluorescence microscopy is more reliable than are the other methods. Systematic examination of various bacteria (cocci, rods and vibriones) by means of fluorescence microscopy never revealed fluorescent forms in the cocci and vibriones and disclosed them only rarely in the acid-fast rods. Exceptions to this rule were the diphtheria and pseudodiphtheria bacilli, for on examination with fluorescence microscopy following staining with auramine they were found to contain fluorescent granules, but their peculiar position and their slight fluorescence prevented their being mistaken for tubercle bacilli. The slight fluorescence exhibited by acid-fast saprophytes following staining with auramine could be reduced or counteracted by treatment with hydrochloric acid alcohol and thus they could be differentiated from tubercle bacilli. Disadvantages of fluorescence microscopy are that it requires expensive apparatus and that it may cause dizziness, fatigue and coughing in the worker who employs the method for long periods. It is suggested that these shortcomings might be eliminated.

Monatsschrift für Kinderheilkunde, Berlin

78: 277-434 (June 8) 1939. Partial Index

Endemic Poliomyelitis of 1938 in Chemnitz and Its Environments. H. G. Huber.—p. 277.
*Renal Rickets. A. Loeschke.—p. 298.
Effect of Parenteral Administration of Vitamins on Leukocytes. Gisela Kobte.—p. 329.
Effect of Ultra-Acoustic Sound Waves on Tetanus Toxins. M. Kasahara, Sha-Shi-Nan and T. Kakusui.—p. 347.
Mongolian Idiocy. J. Illing.—p. 353.

Renal Rickets.—Loeschke presents a clinical, anatomopathologic and metabolic study on a girl aged 6 years with renal rickets observed for two and one-half months. Familial anamnesis was good; likewise the personal history of the patient during the first two years of her life until an antrotomy was performed. The patient was distinctly undersized and undernourished with a skeletal structure indicating general calcium deficiency (knock knees). The urine was turbidly yellow and contained albumin, leukocytes, epithelium and bacteria. Pyuria attested serious anatomic and functional changes in the entire urogenital system. Therapy consisted in daily administration for forty-eight days of viosterol (initial dose of 10 drops two times increased to 12 drops two times = 40 cc.) but with no effect on osteoporosis. Therapy for pyuria and renal insufficiency could not be undertaken. The patient's death from uremia was preceded by edematous formations and increasing anemia, with the hemoglobin count finally as low as 23 per cent. The necropsy revealed a grave pyelonephritic kidney contraction, productive of renal insufficiency, together with bilateral hydronephrosis and a purely hyperplastic growth of epithelial bodies enlarged to twice the normal weight, as well as other characteristics. Metabolic analysis indicated a manifest tendency to phosphate retention and preferential elimination by way of the intestine. Bone examination revealed an enormous mineral impoverishment and abnormal water surplus. In the epiphyses mineral insufficiency was accompanied by a qualitative modification in the inorganic composition of the bones. The author summarizes his conclusions as follows: Renal rickets is in all essentials clearly a vitamin D deficiency of nephritic origin, primarily induced by phosphate retention secondary to renal insufficiency. Phosphate retention is causative of hyperplasia of epithelial bodies and, in consequence, of mineral imbalance. The bone structure presents characteristics of its own.

Zeitschrift für Kinderheilkunde, Berlin

61: 1-134 (June 6) 1939. Partial Index

Stenoses of Upper Air Passages in Course of Measles. M. Heinz.—p. 1.
New Biophysical Method of Differentiation of Human and Animal Milk. M. Kasahara and Sei-ichi Ogata.—p. 28.
Changes of Blood in Severe Infectious Diseases and Other Toxic Influences and Their Relation to Impairment of Adrenals. K. Stenger.—p. 31.
Economy of Vitamin B_1 in Nurslings. F. Widenbauer and H. Krüger.—p. 52.
Electrocardiography in Nurslings. A. Nádrai.—p. 63.
Hereditary Form of Erythroblastosis of the Newborn. H.-D. Pache.—p. 86.
*Pyurias in Children. H. Seidlmayer.—p. 92.

Pyurias in Children.—Seidlmayer says that pyuria is a symptom which may occur in a number of disorders. The term was coined because in infants and young children it is difficult to differentiate between vesical, ureteral and pyelic inflammations, the patients being unable to describe their subjective symptoms, such as pains or pressure in the renal region, burning feeling on urination and the urge to urinate. This report is based on the cases of pyuria which were observed at the internal department of the children's clinic at the University of Munich. Especial attention is given to pyuria in boys, in whom it is much less frequent than in girls. The majority of cases of pyuria in boys of the nursling age (nearly four fifths) develop as a complication of another infection (usually influenza), which reduces the resistance. Deformities or calculi were found to be causal factors only rarely. About two thirds of all cases of pyuria in boys of the nursling age were completely cured. Of the remaining third the majority died during the first year of life. Chronic pyuria developed in only a few of the cases. The often repeated statement that in boys of the nursling age pyuria is a much more serious condition than in girls, in that its lethality is supposedly higher and its duration longer, is not corroborated in the author's material, particularly since sulfanilamide has been employed in the treatment of pyuria. Compared with other therapeutic methods, sulfanilamide produces the best results in children with pyuria. The author says that sulfanilamide was usually administered by mouth. However, in cases in which vomiting made the oral administration difficult, sulfanilamide was given parenterally, usually by intramuscular injection. The urine was free from pathologic constituents after from four to seven days of treatment with sulfanilamide. In order to avoid relapses the author advises that medication with sulfanilamide be continued for about a week after the urine has become normal.

Khirurgiya, Moscow

1-192 (No. 1) 1939. Partial Index

Electric Currents in Granulating Wounds. S. I. German.—p. 3.
Microflora of Operative Wound. Ya. D. Dmetruk.—p. 10.
New Concept in Treatment of Suppurating Wounds. A. L. Pisanovich.—p. 15.
Oil-Plaster of Paris Splint in Fresh Wounds. A. V. Grinberg.—p. 41.
*Rational Treatment of Burns. S. M. Kalmanovskiy.—p. 63.

Treatment of Burns.—According to Kalmanovskiy, infection of the burned surface, rather than the absorption of the products of broken down albumin, is the principal factor in the pathogenesis of burns and is the most frequent cause of death. The treatment has for its aim the combating of shock and dehydration and prevention of infection. Immediately on admission the patient is given a hypodermic injection of morphine or pantopon. Blebs are removed and the entire burned surface is sprayed or painted with 1 per cent aqueous solution of methylene blue or of gentian violet. The patient is laid on a sterile sheet with a cradle framework over him, which is like-

wise covered with a sterile sheet. The desired degree of warmth is maintained by electric lamps placed underneath the cradle. The patients are urged to drink large amounts of warm sweetened tea, from 5 to 6 liters daily. The spraying or painting with methylene blue or with gentian violet is repeated daily for about ten days. With the beginning of demarcation on about the seventh to tenth day, the formed scabs are painted with petrolatum to expedite their sloughing. Patients with severe burns are given sulfanilamide on the assumption that streptococcic infection has the leading part in the infection of burned areas. Since the adoption of the open method the author has been able to save several patients with as much as one third of the entire skin area burned.

Geneeskundig Tijdschrift v. Nederl.-Indië, Batavia

79: 1473-1536 (June 13) 1939. Partial Index

Treatment of Fractures. A. H. Smook.—p. 1479.
Studies on Polyarthritis in Rats: Distribution in Organism of Agent of Rat Polyarthritis. W. A. Collier.—p. 1490.
Occurrence of Echinostomiasis in Java. J. H. Sandground and S. Prawirohardjo.—p. 1497.
*Erythema Nodosum in Nursling. D. P. R. Keizer.—p. 1503.
Xerophthalmia Among Indonesian Population. Mass.—p. 1512.

Erythema Nodosum.—Keizer shows that, although the tuberculous origin of erythema nodosum is of considerable importance, there are still other etiologic factors, because cases are observed in which tuberculosis is certainly not the cause. The author cites two cases of his own observation, one of which he had described previously. The patient was a boy, aged 9, who had a bacillary dysentery. Five days later he presented the typical aspects of erythema nodosum, which three days later were followed by pains in the joints. The tuberculin reaction was negative and remained so. Moreover, the boy remained free from tuberculosis subsequently and his family history was likewise free from tuberculosis. The author thinks that in this case the dysentery was the primary disorder and that the erythema nodosum is to be regarded as an anaphylactic manifestation. The second patient with erythema nodosum was a nursling aged 6 months. Here again the examination disclosed no signs indicating a tuberculous origin of the erythema nodosum, but the child had measles, repeated attacks of bronchitis and bronchopneumonia. The author thinks that the attack of measles was the primary cause and that the relapsing bronchitis and the bronchopneumonia elicited the allergic reaction.

Acta Chirurgica Scandinavica, Stockholm

83: 99-364 (March 18) 1939. Partial Index

Syndrome of Painful Anesthesia Following Section of Sensory Root of Fifth Nerve in Tic Douloureux. H. Olivecrona.—p. 99.
New Palliative Operation in Cases of Inoperable Occlusion of Sylvian Aqueduct. A. Torkildsen.—p. 117.
Cushing's Syndrome: Case in Which Operation Was Performed. H. Wijnbladh and A. E. Nielsen.—p. 125.
Ruptures of Tendon Aponeurosis of Shoulder Joint—So-Called Supraspinatus Ruptures. K. Lindblom and I. Palmer.—p. 133.
*Thyrotoxic Crisis and Hypersensitivity for Iodine. H. Wijnbladh.—p. 143.
Diffuse Leptomeningeal Tumors of the Brain. A. Nielsen.—p. 151.
*Casuistic Contribution to Problem of Conservative Operative Treatment of Hydronephrosis. G. Petrén.—p. 243.
Diagnosis of Tumors of Spinal Cord by Aid of Gas Myelography.—E. Lindren.—p. 303.
*Contribution to Neurogenic Conception of Pathogenesis of Peptic Ulcer. E. Ask-Upmark.—p. 336.

Thyrotoxic Crisis and Hypersensitivity to Iodine.—Wijnbladh says that during the last two years he administered compound solution of iodine by means of continuous intravenous drip with dextrose-saline solution. He used this method in cases of thyrotoxic crisis and in those of severe thyrotoxicosis in connection with subtotal and total thyroidectomies. This method is of great value because it has extended the indications for surgical treatment to the severest cases of thyrotoxicosis. The administration of compound solution of iodine by intravenous drip has so far been used in ten cases. One case is especially noteworthy because it shows that the intravenous administration of large doses of iodine produces a different reaction than does the oral medication with small doses. The patient, a woman aged 28 who had grave thyrotoxicosis, proved to be hypersensitive to the oral administration of iodine, for she developed exanthem and fever and her general condition was impaired. In a spontaneous crisis, large quantities of iodine were given by intravenous drip and there were no signs of iodism and the crisis was cut short. Continued treatment with iodine demonstrated that the crisis or the treatment had desensitized the patient. The woman was operated on and recovered.

Conservative Operative Treatment of Hydronephrosis.—Petrén says that formerly nephrectomy was performed too often in cases of hydronephrosis and that during the last two decades renal surgery has advanced along more conservative lines. Nowadays the majority of surgeons are agreed that nephrectomy should be done only in cases in which the hydronephrosis is so advanced that the kidney has no longer any functional value, or in the event of a severe complicating infection, provided, of course, the condition of the other kidney makes such an intervention permissible and advisable. In other cases of hydronephrosis, conservative operative measures should be resorted to. After reviewing the literature on the so-called plastic operations for hydronephrosis, the author reports three cases of hydronephrosis in which conservative plastic operations were performed and which were reexamined from two and three quarters to five years after the operation. The hydronephrosis was of a moderate degree and the changes at the ureteropelvic junction or in the upper part of the ureter were not pronounced. Fenger's ureteropelvioplasty was performed in two of the cases and in the third case a pyelo-ureteral anastomosis was made. During the subsequent years (from two and three fourths to five) the patients were entirely or almost entirely relieved from their earlier hydronephrotic disorders and urography, performed at the after-examination, showed that the dilatation of the renal pelvis had decreased and its emptying capacity improved.

Neurogenic Pathogenesis of Peptic Ulcer.—Ask-Upmark cites Cushing's opinion on the neurogenic origin of peptic ulcer and then presents his own investigations on the gastric secretion of ten patients with tumors of the brain. He found that in some of these cases the gastric secretion was unchanged, in others it was reduced and in still others it was increased. Reduced secretion was observed in one case of pituitary adenoma; increased secretion with peptic ulcer and hematemesis was detected in one case of cystic cerebellar tumor. The author describes three other observations in which peptic ulcer developed in connection with intracranial lesions. One patient was an adult who sustained a head injury with a blunt object; the second patient had received a shot injury, the bullet being lodged in the cerebellomedullary cistern; the third patient was a newborn infant presumably injured during delivery. The author expresses the opinion that the peptic factor and the neurogenic factor in the genesis of ulcer are made compatible by these observations. He emphasizes that still other factors are at work in the pathogenesis of peptic ulcer: the liver function is frequently impaired and evidence is presented supporting the idea of a close relationship between the central nervous system, the liver and carbohydrate metabolism, disturbances of this functional unit being liable to favor the development of peptic ulcers.

Ugeskrift for Læger, Copenhagen

101: 771-796 (June 29) 1939

*Clinical Experiences After Year's Treatment of Psychoses with So-Called Metrazol Shock. V. Hahnemann.—p. 771.
Nasal Symptoms Following Vaccination Against Diphtheria in Student Nurses. H. C. Andersen.—p. 779.
Part Played by Gonorrhea in Fluor Vaginalis. S. Felding.—p. 781.
Hollweg's Outline of Relation Between Hypophysis and Ovary. Johanne Christiansen.—p. 782.
Cases of Pneumococcic Peritonitis Treated with Specific Serum. B. Larsen.—p. 783.
Apparatus for Oxygen Treatment: Addendum. N. Bay.—p. 784.

Treatment of Psychoses with Metrazol Shock.—Hahnemann reports that in 151 (73 per cent) of the 207 cases of schizophrenia treated according to von Meduna's convulsion therapy the duration of the psychosis had been from two to twenty-eight years. Full remission resulted in forty cases, partial remission in sixty-nine. In the thirty-six cases in which the disorder had existed for less than one year, full remission was attained in twenty-five (69 per cent), partial remission in six (17 per cent) and no improvement in five (14 per cent). Treatment with metrazol was also given in twenty-four cases of depression and fifteen of manic-depressive psychosis. Full remission occurred in all cases. The importance of a rational psychotherapy simultaneously with the shock treatment is stressed.

THE STUDENT SECTION

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Factors Influencing Ethical Concepts and Ideals Among Medical Students

TRAWICK H. STUBBS AND DEAN ROBERTS

ATLANTA, GA.

"Just why do you want to be a doctor?" was the question put to embryonic doctors during their first week in Medical School at Emory University. Four consecutive freshman classes answered it. Their answers furnished the background for a panel discussion at the National Convention of the Association of Medical Students at Philadelphia last December on "Factors Influencing Ethical Concepts and Ideals Among Medical Students."

The subject was discussed under four general heads: 1. What ideals and attitudes do freshman medical students have? 2. What factors influence the development of and changes in these attitudes and ideals? 3. What ideals and attitudes is it desirable for a young doctor to have? 4. What practical steps might be taken to facilitate the development of these desirable ideals? Two half hour periods of open discussion were allowed following topics 2 and 4, during which time several controversial points were debated. No attempt has been made to include the entire panel in this paper. Only the more important points are discussed.

The choice of this subject immediately places one in a realm where definite measurements are impossible, and necessarily the bulk of the material presented represents personal opinions. However, in the absence of more tangible data a sincere exchange of opinion will no doubt lead to a better understanding of the problems involved. In developing this subject an attempt has been made to follow the sound advice of Dr. Howard W. Haggard, of Yale University, who admonishes "I would suggest that you approach your problem in this social matter with the same scientific skepticism and the same meticulous avoidance of post hoc reasoning as that with which you approach your researches in physiological sciences." It is recognized, of course, that every medical school presents a different problem. Some of the statements here will apply to only a few schools; others have more general application.

THE FRESHMAN

Naturally the most obvious factor involved in this consideration is the fundamental character and integrity of the student as he reaches medical school. Certain maturing processes are common to young men of this age regardless of what profession they have chosen. Many of these have, of course, begun long before the student reaches medical school and will continue after he leaves. Of those factors peculiar to medical students, some begin to exert an influence during the premedical training. For example, many students, intent on thorough preparation, so concentrate on the premedical sciences that they neglect the development of a broader cultural background which would aid in the development of a well rounded philosophy.

The premedical student frequently is faced with the necessity of readjusting many indoctrinated concepts and authoritarian beliefs to conform to new concepts and scientific truths with which he becomes acquainted. Often he fails to work through this dilemma to a satisfactory, mature philosophy and is unable to discriminate between the valuable and the worthless in the ideas which he discards. The process of developing a coherent philosophy is still in its very early stages for many men entering medical school.

In medical school the emphasis on scientific subjects is continued, and for many there is an inability to relate the information harmoniously because the conflicts and contradictions have not been eliminated by the substitution of a revised and adequate philosophy.

Important in the outlook of the freshman medical student is his incentive for entering medicine. Many men have no doubt drifted into

In the preparation of this panel the opinions and advice of many deans of medical schools and other medical authorities were sought. Excerpts from their letters, of which more than fifty were received, are being prepared in pamphlet form and will be available to those interested. Requests should be addressed to The Journal of The Association of Medical Students, Editorial Office, New York University Medical School, 477 First Avenue, New York City, or to Resident Committee, Association of Medical Students, University of Illinois College of Medicine, Chicago, Ill.

the position of beginning a medical career without ever having thought through logically and completely their reasons for choosing this profession. Those who have been influenced principally by the desires of parents or relatives are likely to be and to remain somewhat immature. Those whose motives are social prestige or the attainment of wealth and prominence are likely to respond to situations in a manner quite different from those whose motives are founded on a sincere desire to serve. Some student entering medicine may see only the glory and the romance in the profession without realizing that back of it is a life of hardship. He has a too sentimental conception of the profession—dreams of just going from place to place healing people and doing good. He fails to realize that he frequently has to get his hands dirty, that osteo smells bad, that rectals are necessary, that disease is not often pretty and clean, that he will often have to stand helpless and wait for death.

NARROWING INFLUENCES

There are a number of factors in the lives of medical students which militate against the development of well rounded individuals. The mass of medical knowledge which must be acquired in four years has grown so tremendous that it taxes the ability of even the best student. The average student finds himself confronted with a task that requires every ounce of his effort. He is frightened by the possibility of a failure which will permanently eliminate his chances of becoming a doctor. Under this pressure of crowded curriculum and fear, the student has little use for anything not directly connected with medicine. There is no time left for him to think in terms of relating himself to society as a whole. The process of the integration of the personality is neglected. Those factors by which one develops a coherent philosophy and by which he relates himself to the whole picture are often subtle and intangible. The student who previously has been subject to strong religious influences and interests has no time in which to continue developing this aspect of his life. He is so concerned with the means of becoming a doctor that he has little time to consider the ends toward which he is working.

The "Principles of Medical Ethics of the American Medical Association" strikes the keynote of what these ends should be. The introductory paragraph, entitled "The Physician's Responsibility," states:

> A profession has for its object the service it can render to humanity; reward or financial gain should be a subordinate consideration. The practice of medicine is a profession. In choosing this profession an individual assumes an obligation to conduct himself in accord with its ideals.

The doctor's responsibility is to solve the patient's problem or to help him solve it himself. This means that he must first understand the patient. To understand people he must be genuinely concerned about the welfare of individuals; he must have a profound respect for human personality. It cannot be denied that his work is predicated on the recognition of the worth of human personality. He is interested first in people, only secondarily in disease; he treats diseases only that men may live more comfortably, more effectively and more abundantly.

Physical maladjustment and disease cannot be separated from one's personality as a whole. The modern physician must treat the whole person. To the doctor who is interested in solving the problems of his patients, a sound, consistent, well rounded philosophy is as essential as a knowledge of pathology and therapeutics. If he is to understand fully the patient's problem, he must understand the mental and moral as well as the physical conditions related to it.

CAN A STUDENT'S ATTITUDE BE INFLUENCED?

In considering these changes that occur in character during the four years in medical school it might not be misleading to compare this to the treatment of tetanus with antitoxin. A certain number of these patients will get well and a certain number will die regardless of the treatment or the lack of it. However, with adequate treatment a number will recover who would otherwise die. So it is with character development in students. Some will have high ideals and keep them regardless of the peculiar situations presented by medical education. A few show little or no possibility of responding to humanitarian influences. In between is a large group which will be definitely influenced for good or bad by the many factors surrounding medical students.

The direction of this change is strongly influenced by intangible forces which go to make up the atmosphere of the school. This thought is clearly expressed in the following statement by Dr. Reginald Fitz, of Massachusetts Memorial Hospitals:

> Medical schools, like people, have their personalities. The factors influencing ethical concepts and ideals among medical students depend in large measure on the personality of the school where the student works. This in turn largely is influenced by the character and ideals of the teachers and the spirit of the school. What public opinion says shall be done or shall not be done in a given school, the manner in which the fascination of medicine is presented to the student body, and various other currents of thought are what set the pace in the medical schools for which I have most respect.

The thinking and behavior of the student are influenced to a great extent by the group in

which he finds himself. All too frequently the tone of a school is set by a loud minority who are seeking to impress their fellow students with their lack of inhibitions and restraint. This eloquent minority is so quick to express itself that many important issues are sidetracked by ridicule, and intelligent consideration of them is precluded by a superficial atmosphere. In most cases these students are not conscious of the influence they are exercising. There is a natural reluctance to give any suggestion of a "better than thou" attitude. In fact most students bend over backward to avoid this. They carefully refrain from making any remarks that might be interpreted as idealistic or humanitarian, and yet the greatest heritage of our profession is the tradition laid down by the unselfish lives of great doctors. The action of the minority referred to is not premeditated —it is usually the extroverted expression of inadequate personalities. These students are talking big and bold to bolster their ego. Unfortunately, in so doing they frequently set the whole atmosphere of a school. We are all tremendously affected by social approval or disapproval. There is a strong desire to fit in with the popular conception of what students are supposed to do and think.

Chapters of the Association of Medical Students have a great opportunity here. They are open to all medical students and should serve as a rallying point for those students who have a concern for the moral and social aspects of medical training. They can create situations in which careful consideration of fundamental principles is appropriate. This will lend dignity to discussions of social and humanitarian issues. Group activity may thus relieve the individual of the seemingly unpleasant role of appearing to have ideals above those commonly accepted.

INFLUENCE OF TYPE OF RECREATION

Traditionally, medical students tend to feel that, by virtue of their peculiar situation, of the strain of study and the closeness to the mysteries of life, they deserve license for certain freedom which in others might not be so respectable, such as getting drunk after an anatomy exam. The types of recreation a student learns to enjoy have a subtle and very real influence on his attitudes. If selfish indulgence is his method of relieving tension, the same spirit may carry over into his whole outlook toward his work. On the other hand, relaxation by turning to some different but nonetheless constructive pastime develops habits which will insure a life of greater cultural value and more lasting pleasure. If he takes time for the development of hobbies that are worth while he will find opportunities for expanding his creative abilities and will not feel so keenly the pressure of the constant grind. No apology need be made for the idea that it is desirable to learn to relax without attempting escape from reality.

The development of friendship offers opportunities either for mutual trivial wasting of time or for constructive common interest in commendable pursuits. There is no reason why friendships on the basis of sports, music, reading or serious discussion cannot be as enjoyable and satisfying as those confined to poker, jokes, liquor and sex indulgence. If adequate facilities for wholesome recreation are easily accessible, the mere factor of convenience may determine the habits of students.

Fraternity life can be one of the most wholesome influences in a student's career. Association with the other men affords an opportunity to understand people better and often leads to helpful, lifelong friendships. Informal contact with prominent alumni helps keep the student in touch with inspiring men of the profession. Under the stress of the medical school routine, the temptation is great for fraternity groups to forego the opportunity of making the fraternity atmosphere as constructive as it might be.

INFLUENCE OF MEN IN THE PROFESSION

One of the strongest influences to which a medical student is subject is the example set by other physicians, both the great men of medicine of the past and those who are still living. Many students enter medical school because of their desire to emulate some respected doctor—often the family physician or a close relative. Many receive their inspiration from the biographies of great men.

The expense of a medical education has frequently caused the student to obligate himself financially so that on entering practice he feels that his first duty is to earn enough money to repay his debts and to declare his economic independence. The high cost of equipment for adequate medical practice, office expenses and the keen competition for pay patients tend to force the young doctor to place primary consideration on the commercial aspects of his practice. This phase of the practice of medicine, distasteful to many yet difficult to circumvent, may cause many students, as they begin to see the profession from the inside, to lose faith and to subordinate their motives of service. This influence may be greater during the first few years out of school than actually in school. This disillusionment is unfortunately increased by occasional contact with those unscrupulous practitioners who exploit their patients and abuse their professional privileges.

Offsetting these undesirable influences are the examples of those splendid physicians who find, in their desire to serve, something bigger than themselves in the light of which petty selfishness

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fades. Their common interest in the welfare of men leaves no room for jealousy and antagonism. Realizing that no amount of high motives takes the place of hard work, they constantly study to keep abreast of new developments and seek to make some original contribution to the common store of knowledge. Aware that their task is keeping people well, they stress more and more the importance of preventive medicine. No longer seeking to make a mystery of their profession, they teach the truth they know that people may keep themselves well. These are men of broad horizons: horizontally they have a world view; vertically they think in terms of future generations.

The inspiration of these men strengthens the student's determination to consecrate the best he has to the highest he knows. Progress in this adventure varies with individuals. Some feel that a humanistic philosophy affords an adequate basis; some find in the teachings of Christ the highest concept of the meaning of a life of service. Whatever his philosophy or whatever the basis of his motivation, the student finds conscious effort necessary to continue development. Those who are preparing for this life of service will do well to give considerable time to the conscious development of those attributes of character which embody the ideals implied in a profession of service.

Comments and Reviews

THE ENTRANCE INTO MEDICINE

Abridgment of an address by Hugh Lett, president of the Royal College of Surgeons of England, in the British Medical Journal June 10, 1939.

When I became a student, forty-five years ago, the medical curriculum was very different from what it is today. X-rays and radium had not been discovered, abdominal operations were few, the surgery of the brain and thorax was rudimentary; nothing was known of vaccines, vitamins or hormones, little of blood diseases, and the work in clinical laboratories was confined to the simplest examinations. There were no antepartum departments or special departments for diseases of children or infant welfare or for orthopedic, genito-urinary or chest surgery, to mention only some of those there are today.

FUNDAMENTAL PRINCIPLES

Although much more is now known about every branch of medicine and there is much more to learn, the fundamental principles of medical education are the same. Now as then there are things that must be known, some that ought to be known, and others with which the student should have some acquaintance if only to satisfy examiners. That is not all, for in addition to acquiring medical knowledge the student is taught to cultivate accuracy, observation and deduction and to reason carefully, so that he may be able to bring a trained intelligence to bear on medical problems.

Medical education should mean much more than the acquisition of so many facts and theories; it should train the mind in such a way that it may be ready to take the initiative, to adjust itself quickly to new situations, to apply to each case in an understanding way the principles, the routine, the discipline which have become second nature. The years spent as a medical student are only an introduction to a study which must continue throughout professional life.

THE PRECLINICAL YEARS

You may feel impatient at the time that must elapse before you reach the wards and come into contact with sick people. You may feel that the time given to chemistry, physics and biology, and a great part of what you are taught in anatomy and physiology, are quite unnecessary; yet these subjects have a very important bearing on clinical work. A preliminary knowledge of them is essential if you are to understand the methods of examining patients, and certain forms of treatment.

We owe much to physics, first of all the x-rays, which are of immense value in the diagnosis of disease, and radium, which like the x-rays has done much for inoperable cases of malignant disease. Physicists discovered the ultraviolet rays, which play an important part in the demonstration of ultramicroscopic viruses. I need hardly refer to the importance of electricity. Before long the method of electro-encephalography will enable us to determine the exact site of a tumor lying deep in the brain. Lastly, we must not overlook the developments of optical instruments by which we can see the interior parts of the body.

Biochemistry has taught us about vitamins and the vital importance of the secretion of the ductless glands and has given us many remarkable drugs which have revolutionized the treatment of a number of diseases, so that with the help of these drugs we expect recovery in many cases which formerly would have been regarded as hopeless.

Much of the valuable experimental research that is being done today could never have been attempted had it not been for the advances that have been made in physics and biochemistry.

And so, if we recognize how much medicine and surgery owe to them, it is not difficult to understand why physics, chemistry and biology form the first part of the education of the medical student.

Anatomy and physiology teach us the structure of the normal human body, the functions of its various organs and the part they play in the life of the healthy individual. It is obvious that we must have a clear understanding of the body in health before we attempt to recognize the changes that take place when it is diseased and before we can understand why these changes give rise to the various symptoms and signs that show illness and disordered function.

An important advance in medical education was made recently when it was decided that while the student is still working at anatomy and physiology he should be taught something of the elementary principles of medicine and surgery and learn certain methods of examination which previously were taught only in the clinical years. This elementary clinical instruction helps one to appreciate more clearly the importance of anatomy and physiology, for the gap that previously existed between them on the one hand and medicine and surgery on the other is now bridged, and they are no longer treated as independent parts of the curriculum.

THE CLINICAL YEARS

When you reach the wards and begin clerking and dressing, you will find that among other duties you have to take histories of patients. A good history includes an account of the patient's illness and his previous health, his present symptoms, and finally a description of what you have been able to discover after careful examination not only of the part that is principally affected but of the whole body.

I remember a student who said that he really did not see why he should spend his time taking notes for the benefit of the hospital. I may say, perhaps, that from my recollection of his notes any benefit that the hospital could have derived from them was remarkably small. But he was approaching his work in the wards from the wrong angle. It did not occur to him that the taking of histories was an important part of his education. Careful, systematic note taking and a routine examination of the whole body in every case will teach you method, develop your powers of observation and impress the details of cases on your memory. The importance of examining the whole body is sometimes overlooked, and the omission has been followed by serious results.

Do not be too much afraid of making mistakes. We all make them; but if we make mistakes in spite of having exercised care and thought, and if when we have made them we try to find out where our reasoning or observation was at fault, we may learn more from our mistakes than from our easy or sometimes fortunate successes.

Try so far as possible to make a preliminary diagnosis before the results of the x-ray examinations and the clinical laboratory tests are available. In many obscure cases such a diagnosis will not be possible; nevertheless it is a sound practice to try to make it. Some day you may be in such a position that these examinations cannot be made, and you may have to make a diagnosis when you and your patient are far from an x-ray apparatus or a clinical laboratory. But an even more important reason for following this method is that by doing so one acquires keener powers of observation, reasoning and deduction. The rapid progress made in medicine and surgery has brought a certain danger in its train: the possibility that too much reliance may be placed on the result of tests in the laboratory and examinations in the x-ray department at the expense of careful clinical examination. This can never be replaced.

A full and careful study of the patient, body and mind, is the essential foundation on which our healing art is built. The training of our students must be directed above all to the cultivation of careful clinical observation and an understanding and appreciation of signs and symptoms. In this way only can they acquire that vital yet intangible something we call clinical instinct. Clinical instinct, born of observation, must and always will remain one of the greatest and most important gifts a medical man can have.

THE APPROACH TO THE PATIENT

It is remarkable that in the past the medical student should have received so few hints on the attitude to be adopted toward patients, the way to approach them, to manage them, to obtain their confidence. On entering practice he has had to rely on his natural gifts and instinct, or perhaps, if he has been fortunate, on his ability to copy an admired clinical teacher. And yet the importance of understanding the patient and appreciating his mental condition and outlook has long been recognized, even by laymen.

The introduction into the curriculum of psychology and some knowledge of the psychoneuroses and of the important part the mind plays in good and bad health should be a help to both doctor and patient. But the physician who in the approach to his patient cultivates sympathetic understanding, cheerfulness and confidence may be said to have acquired already the fundamentals of bedside or consulting room psychology.

Sentimentality must of course be avoided, but if you can develop a sympathetic understanding of your patient's anxieties and difficulties you

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will find that you can help him greatly. You will be able to do much to reassure him, to remove great and little discomforts, both physical and mental.

A quiet cheerfulness is a great asset. The gloomy physician "maketh the sick man sicker." Sir Benjamin Brodie said that it was a good rule in the practice of an art, as in the common affairs of life, to look on the favorable side of the question so far as it was consistent with reason to do so. But the cheerful attitude does not mean that aggressive, bouncing cheerfulness which can be so very irritating, especially to the sick man. If you should be anxious about your patient, try to conceal your anxiety and remember that while you are making your examination and talking to him he will be searching your expression to learn whether you really believe in the assurance you are trying to give him.

Confidence can come only with experience and hard work, by learning from what you have seen and read, and by thinking over the reasons for your successes as well as your mistakes. Nothing is more ugly than conceit or vanity, but they are very different things from that confidence in which, said the prophet of old, shall be your strength.

SHOULD STUDENTS MARRY?

Slightly abridged from an article by C. C. Gibbons in the Surgeons' Hall Journal of June 1939, which journal is published by the students of the School of Medicine of the Royal College of Physicians and Surgeons, Edinburgh, Scotland.

It was with mixed feelings that I left the *Journal* office with the assignment to write, to say the least of it, a controversial article. In fact, every time I thought of it I found myself bemoaning the fact that I ever joined the writing staff of the *Surgeons' Hall Journal*. . . . However, I had to tackle it. . . .

Interviewing the married students was an "interviewer's paradise." They seemed surrounded by an air of contentment; their powers of concentration when dealing with questions were infinitely greater than that of the unmarried student, who seemed eager to leave me high and dry whilst they went dashing after some trivial pleasure or imaginary errand; I had to force them into a corner and make the wildest promises until the answers to my questions were squeezed out of them.

The married students were definitely in favor of marriage for students. All claimed to a more settled attitude toward their work after marriage than before. I inquired as to what they attributed this and they all gave the same response, that their needs were satisfied, bringing a greater cohesion in their psychologic makeup.

"But what of the financial side of things?" I asked. Well, the general view was that, if you have a wife who shows consideration toward your position and is ready to forego some of the luxuries and also cooperate in a responsible plan of domestic economy, the chances of an unhappy struggle are remote. The fact that the prospects of the future are bright, and by complete cooperation between student and wife that future can be realized, was an incentive to both, and a definite encouragement to them in these days when the question of marriage was being discussed and weighed in the balance.

"Don't your wives find at times that as students you are difficult to live with?" "Of course," was the general reply to this question, "they realize the strain of prolonged study, the anxiety of approaching examinations and the deplorable system of medical education, with its cram and absurd academic demands. Prior to marriage they knew us, and we haven't changed for the worse. Anyhow, lawyers, doctors and clergy are often difficult to live with, even plumbers, taxicab drivers and clerks." I asked: "How much do you think you need to marry on?" Here I found a difference of opinion, but all agreed that 3 pounds 10 shillings a week was sufficient, provided you had a little capital behind you or a guarantor. I then asked my last question: "Didn't your parents object?" "At first they were antagonistic toward the idea, but eventually they realized our point of view and have come to regard our marriage as a sound investment rather than a liability. For, after all, why should a student be denied the advantages of a wife and home simply because he has taken a course of study extending over the best years of his life?" To the younger students this does not apply, but to the older students it has a definite and real meaning.

I came to the conclusion that married students were definitely at an advantage, and not only was there an air of confidence about them but their academic performances in relationship to examinations proved conclusively that marriage aided better results rather than the contrary.

The single students talked of economic difficulties—the fact that they must provide a home of idealistic luxury seemed to worry them. Their ideas regarding a standard of living was influenced by a lack of experience—indeed, to one of them, 10 pounds a week was a mere pittance. I hid my smile, raised my hat and wished him luck. He doesn't realize that the majority of people today in this country are living on nearer 2 pounds a week than 3 pounds a week, with little prospect of more. From even the single students there was little or no opposition to students marrying provided, they

all agreed, you find the right partner and not one who would prove an encumbrance.

I felt rather disappointed that I hadn't found any one with real objections. Perhaps you have? Then write a letter to the editor and let him print your objections. After all, there are two sides to every question.

STUDY OF ACCOMPLISHMENT OF THE 1937 FRESHMAN CLASS

Abridgment of an article by Dr. Fred C. Zapffe, published in the Journal of the Association of American Medical Colleges, May 1939.

A study of the accomplishment of students enrolled in the freshman class of the seventy-seven medical colleges in the United States and eight in Canada which participate in the study by furnishing the information on which it is based has been made since 1928; therefore the data presented herewith constitute the tenth report.

The total number of students reported on by all medical colleges at the end of the academic year 1937-1938 was 5,994. There has been a steady reduction since 1934-1935, when 6,683 freshmen were reported. Of the 12,128 students who applied for admission to the 1937 class 7,543, or 62.1 per cent, were accepted. . . . The accomplishment of those enrolled was as follows: clear, 75.4 per cent; encumbered (subject conditions or failures or both), 12.7 per cent; must repeat, failed, dropped, withdrew because of poor or failing scholarship, 8.9 per cent; withdrew on account of illness, lack of sufficient finances or reason not given, 2.9 per cent. This gives a percentage of 11.8 of all freshmen who were not promoted to the sophomore year, assuming that all those with subject conditions or failures succeeded in removing them and subsequently entered the sophomore year. These results are a distinct improvement over those of the 1936 class.

A study of the degree of preparation of these students discloses interesting facts. First, there is an increasing tendency for prospective medical students to remain in college longer. Whether this should be ascribed to a desire for better preparation or to a belief that it will help to secure admission to a medical school is a question. But when the better accomplishment is taken into consideration, one is almost forced to believe that students remain in college longer to be better prepared for the study of medicine. Of the 1937 class, only 6.55 per cent had less than three years of college work. The number of students holding a bachelor's degree or better was larger than in previous years, 55.75 per cent. Each year those with lesser preparation have diminished in number, whereas the degree holding group has steadily increased in numbers. The group with three years or more of preparation but less than four years has remained fairly constant. In 1937 the percentage was 32.3. The four or more years group not possessing a degree has also remained constant, 5.4 per cent in 1937.

The four or more years group is definitely a hazard. Although some members of this group have attended college for as many as eight, even nine, years, they do not seem to have the right preparation, aptitude or attitude for the study of medicine. Perhaps one should regard too many years in college as an indication of unfitness for the study of medicine. True, the group is not large, 333 in 1937. They make the poorest showing on all counts of any group.

It is quite evident that students are beginning to appreciate that it is wiser to take the courses of study which lead to the bachelor of arts degree than those which lead to the bachelor of science degree. The cultural courses of the long ago are coming into their own again.

The women students numbered 341 in the 1937 class. The women do not do as well as the men. Despite more preparation, they had fewer clear records, more encumbered records, more failures and more withdrawals.

The total number of women students in all four years in 1937-1938 was 1,109 as against 20,538 men students, or 5.4 per cent. At the end of the year 1937-1938, 253 women received the degree of M.D. Included in this total are women who completed their college work in June 1937 but were not eligible for the degree of M.D. until after the completion of a one year internship.

Some medical colleges will not allow any student to repeat; others do. Every year there is a considerable number of repeaters. In the 1937 class there were 198 repeaters, 3.6 per cent of the total number of freshmen. Thirty-five of these repeaters failed again and ten withdrew; in reality, only seventy-two of the 198 repeaters justified their acceptance.

Of the 1937 class, 79.2 per cent took the medical aptitude test. Each year more and more students who are thinking of entering medical school take this test. Even if a student does not intend to study medicine, the test is a fine thing to take because it helps to show him where he is weak and where he is strong so far as knowledge and aptitude are concerned. Perhaps too the test helps to bring about a change of mind by convincing a student that he should not study medicine. In either case it is worth while.

DATA FOR CANADA

In proportion to population, Canada has at least as many medical students as we have, if not more. The ten Canadian schools graduated 572 students, about 11 per cent as many as our own medical schools graduated. Many of that group are citizens of the United States who for

some reason or other studied medicine in a Canadian medical school. McGill has always had quite a number of students from the United States. Most of the Canadian schools do not accept any students from the United States.

MENTAL HYGIENE PROBLEMS OF THE COLLEGE STUDENT

Abridgment of an article by Dr. Harry M. Tiebout published in Preventive Medicine, November 1938.

There are certain standards of behavior in the college setting which are generally accepted as valid evidence of normal or satisfactory adjustment. If the student (1) on the health side keeps relatively free from sickness, (2) on the educational side does the required work adequately, (3) on the vocational side sticks to his courses without too much scattering or shifting, (4) on the personal side manages his relationships with his teachers and classmates with fair success and (5) on the mental side displays no serious oddities or quirks of behavior, then he is considered to be a normal member of the college community. Within each of these five categories there is admittedly room for wide variation but, without getting into argument as to when that time comes, in each of these groups there does come a time when the extent of the variation is sufficient to warrant the feeling that the individual is deviating significantly from the usual pattern and is in need of help. College people accept without question the need for a healthy body as a prerequisite for successful educational progress. They believe that adequate sleep, proper diet, sufficient exercise and regular living are essential to the maintenance of health and they do what they can to foster these beliefs in the student group. Furthermore, the well equipped college can handle with reasonable satisfaction run of the mill physical ailments which constitute a majority of infirmary calls. There are, in addition to those with a demonstrable physical condition, other students who frequent the infirmary complaining of many symptoms, yet suffering from no definable physical malady. They correspond to a similar group found in practice and offer interesting points for psychiatric study. They are the so-called neurotics.

The neurotic group may be divided into two types: (1) those suffering from out and out neuroses and (2) those having a condition less easily defined but constituting a perplexing diagnostic problem in which organic and functional elements coexist. The symptoms of the neurotic group are usually cardiac or gastric in nature.

There is probably nothing unique in the neurotic manifestations that show themselves in college life. They seem to appear during the stress of new adjustments associated with entering college and perhaps are more than customarily prone to be marked by a physical symptomatology. Their treatment differs in no essential way from their treatment in other surroundings and is, as a rule, more successful.

EDUCATIONAL DEVIATIONS

Failure on the part of the student to progress in accordance with his level of ability is now considered a problem of mental hygiene. The well equipped college recognizes the fact that students vary widely in capacity. They are given psychologic tests and they are not expected to progress at a speed faster than the capacity indicated by their test scores. If the test score indicates that the person's rate of progress will be below the minimal standard for the particular college, he or she is not admitted as a student. This does away with the old hit or miss practice in which the college sifted out the good students by flunking the poor ones, giving no thought at the time to the feelings of the students who flunked. Nowadays, when a student fails, the question automatically arises "What is interfering with his work?" Often the interfering factor is readily discernible; a complicated home situation, poor health, financial stringencies, or a girl or boy problem may prove to be the distracting element.

VOCATIONAL DEVIATIONS

What the normal attitude of the young person in college toward his vocational choice is is open to question. While I do not believe that the student in his teens should be utterly aimless in his thoughts about his vocational future, I doubt the normality of the student who, from childhood, has been fired by a burning desire to be a something or other. Such zeal is apt to rest on compensatory foundations and not necessarily on worthwhile abilities. In my experience the greater proportion of students find the present pretty satisfactory and generally think in terms of it. Too much concern about the future leads to doubts and hesitations about the present and a lessening of scholastic effort and accomplishment.

PERSONAL DEVIATIONS

The college today is taking cognizance of the fact that its responsibilities for the individual student extend beyond the student's successful absorption of knowledge to the indefinable field of personality development. The unhappy student, the lonely, withdrawn student, the rebellious student, the lovesick student all call for help. Their problems, if allowed to continue unnoticed, may interfere with their obtaining the maximum benefit from college experience.

MENTAL DEVIATIONS

Aside from the neuroses, problems of outright mental deviation do not bulk large on the college horizon. There is the occasional early schizophrenic development, the relatively rare frank depression or excitement, the occasional suicide. Delinquencies also are rare, although epidemics of stealing occur, the offender or offenders needing psychiatric attention when apprehended. The alcohol problem is a constant source of concern, not because it involves a large proportion of the student body but because the alcoholic student stands out like a sore thumb. In treating the relatively rare case of alcoholism, it is assumed, rightfully, I believe, first, that there is a psychologic factor at work which causes the resort to drinking and, second, that as a consequence of the first assumption the problem can best be managed by removing the causative factors through psychiatric treatment. With this group, detection of the serious cases is the chief function of the college psychiatrist. I want to bring the general practitioner into this picture. Where does he function in a college mental hygiene program? For two reasons he has an inevitable advantage over the school. First, he has known the individual student for a long time and, second, he has the confidence of the family, who will take his advice far more readily than that of a new physician. Every practitioner fully appreciates how often he has an advantage over the psychiatric specialist when it comes to diagnosing a case in which long contact with a patient and his family affords a background of understanding far more helpful in sizing up the individual than hours spent in gathering the case history. This being the situation, it is unfortunate that the general practitioner passes on so little of this information to the college in the questionnaires supplied by the student health department immediately prior to the student's admission to college. I wish it were possible to impress on the family physician how pleased the school is to receive a thoughtful report from a student's doctor, how carefully it safeguards such material and how much more secure it feels about going ahead on a constructive program for the student. Again, the family doctor occupies a more effective position than the school with the student's family. In the treatment of nervous troubles it is a truism that, unless the cooperation of the family can be secured, therapeutic efforts are wellnigh hopeless. If the family physician puts his stamp of approval on the suggested treatment, the family is likely to cooperate more wholeheartedly.

A school mental hygiene program therefore must rely to a very considerable extent on the family physician.

COMPILATION OF COURSES OFFERED IN HIGH SCHOOLS

The Office of Education of the United States Department of the Interior has made a vast compilation of courses[1] offered and students registered in the high schools of the United States. The authors say that more time and effort are given to English than to any other subject field. Social science is second in curriculum emphasis but is a considerable distance behind English. Commercial work and science are found close together in third and fourth places. Physical education is also in close proximity if it is allowed to borrow hygiene and sanitation from the science group of studies. Sixth place belongs to mathematics, seventh to foreign languages as a group, and eighth to music. Mechanical drawing holds the balance of power for the next three positions; if it is given to drawing and art, that field is in ninth position; if it is given to industrial and shop subjects they take ninth place and, if it is assigned to neither of these, home economics steps into ninth place. Of the subjects here treated, agriculture is in last position. That English stands first is interesting in the light of the dictum of President Hutchins that most college graduates can neither read, write, speak nor think.

GROWTH OF THE BOSTON CITY HOSPITAL

The present great institution with many departments, clinics and offices seems far removed from the unpretentious beginnings of the Boston City Hospital in 1864. The hospital has treated more than a million patients. While Boston ranks ninth among the cities of the United States in population, the Boston City Hospital ranks fourth in the number of patients treated. Its growth in size has been less remarkable than its progress in the character of service rendered. In 1870 the patient remained in the hospital an average of twenty-seven days, whereas the corresponding figure now is eleven days. A recent article by Merrill Moore[2] shows that the death rate has declined from more than 13 per cent in 1894 to less than 7 per cent in recent years. In fostering the scientific spirit of the medical staff and in definitely assuming an educational responsibility, the Boston City Hospital has won a reputation which attracts students and physicians from all parts of the world.

1. Offerings and Registrations in High School Subjects, 1933-1934, United States Department of the Interior, Office of Education.
2. Moore, Merrill: The Growth of the Boston City Hospital from 1864 to the Present, New England J. Med. 218:867 (May 26) 1938.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

Students Who Hold Harvard's National Scholarships

The three outstanding candidates for admission to Harvard Medical School, Boston, this fall as recipients of national scholarships offered by the school are Louis E. Ward, Mt. Vernon, Ill.; Samuel R. Ginsburg, Passaic, N. J., and Allan L. Friedlich Jr., New York. This is the third year of the school's national scholarship plan. The three students who received the awards in the freshman class of Harvard Medical School last year have maintained honor records and have had the stipends renewed for the remaining three years of their medical studies. They are Glen R. Leymaster, Aurora, Neb.; Clarke T. Case, Pyinmana, Burma, India, and Laurence G. Wesson Jr., Boston.

The three students who won the Harvard national scholarships in the first competition and who are now entering their third year of study at the medical school are Ward S. Fowler, Eldora, Iowa; Carl C. Gardner Jr., Columbia, Tenn., and William F. Loomis, Tuxedo Park, N. Y.

The Tower Club at Ohio State University

Faced in 1933 during the financial depression with the loss of many worthy students, Ohio State University undertook to help them by providing a dormitory in one of the towers of the university stadium, where only $3 was charged for room for the academic year and $2.75 a week for board.

The three upper floors of the Tower Club provided sleeping quarters; on the first floor were the dining room and kitchen. There were showers, lockers and a game room; the dining tables later were used for study facilities. The university provided beds, mattresses and pillows. Men live in rooms or rows accommodating from fourteen to forty-two, each with a floor captain who is responsible for the cleanliness and discipline of his group. The students do all the work except the cooking. Their personal laundry is usually mailed home. Students are rated on the kind of work they do in the dormitories, and permission to remain in these groups depends on the scholastic and conduct records established, including the performance of dormitory work. The Tower Club became so popular that an extension had to be built the following year, using space in a section of the stadium adjoining the tower and under the stadium bank seats; still other units were added until their capacity reached 800. There is an esprit de corps that characterizes the personnel of these dormitories. The Tower Club men wear a button indicating pride in membership. There are several times as many candidates for these dormitories as there are places for them. Admission is open to Ohio students only on the basis of scholarship, character and financial need.

Yale Plans to Expand Medical School

A committee has been formed to publicize the work of Yale University, New Haven, in medicine and health as a step toward the establishment of a program to obtain funds for expansion. Dr. Harvey Cushing is general chairman and Dean Stanhope Bayne-Jones, chairman. Other members of the committee include: Fuller F. Barnes, Bristol, Conn.; William McCormick Blair, Chicago; George Parmly Day and Thomas W. Farnam of Yale; Dr. Norman E. Freeman, Philadelphia; Harry C. Knight, New Haven; Fred T. Murphy, Detroit; Charles Edward A. Winslow, Dr. P.H., and Dr. Milton C. Winternitz of Yale. The committee's efforts will be turned especially toward alumni and close friends of the university. According to the New York *Times*, a doubling of the school's endowment for medical education and research is sought. Capital is sought to provide annual income now furnished by grants, especially in the department of psychiatry and mental hygiene and the clinic of child development. In addition to providing training for general practitioners, the school plans to increase opportunities for the education of specialists in fields of surgery, medicine and public health. Desirable additions to the physical plant of the school include a building for the library and an auditorium.

Thirteen Students Win Crile Awards

The thirteen students at Western Reserve University School of Medicine, Cleveland, who have been awarded Crile Scholarships for research during the coming year, according to dean Torald H. Sollmann, are: Robert R. Berneika, Joseph Dimont, Edward W. Shannon, Daniel A. Brody, Roger K. Kalina, Joseph Kovacs Jr. and Aaron Paley, all of Cleveland; Salvatore M. Sancetta, Cleveland Heights; Edmund F. Schroeder, Shaker Heights, Ohio; John M. Cook, Basil, Ohio; Joseph Selman, Albany, N. Y.; Jay R. Wells, Parkersburg, W. Va., and Louis G. Ralston, Lakeland, Fla.

Loan Funds at Cornell

The Cornell University Medical College, New York, administers the 1923 Loan Fund, which amounts to $400 a year and is available as a loan to a student needing financial assistance, preferably to a third year student. The college administers the alumni association loan funds and also the Student Loan Fund, a revolving fund founded by students in the medical college and available to members of the third and fourth year classes.

There is also at Cornell a number of scholarships available to students, which are awarded, however, primarily on merit, with need a secondary consideration; also prizes for general efficiency in certain departments. Three prizes are awarded for efficiency in gynecology to members of the senior class in the order of merit. These prizes, $125, $75 and $50 respectively, were established by Mrs. W. M. Polk in memory of her husband, who was dean and professor of gynecology for many years preceding his death in 1918. Application should be made to the office of the dean.

Tuition and Other Fees at Cornell

The tuition fee at Cornell University Medical College, New York, is $500 a year, and an advance of $100 on account is required of all applicants accepted for admission. There is also a matriculation fee of $10 payable on admission, a special obstetric fee of $10 payable at the beginning of the third year and a fee of $25 payable on registration for graduation. There is a breakage deposit fee of $10 required of all first and second year students at the beginning of each academic year, but this will be returned, less the amount charged for breakage, at the end of the year. All students entering the college must have microscopes and later hemocytometers and hemoglobinometers. The average cost per year for books is estimated at $75, according to the last available announcement of the medical college.

Honor Students at University of Maryland

At the commencement of the School of Medicine of the University of Maryland in June in Baltimore, graduate James Baker Nuttall was awarded the University Prize Gold Medal and Graduate Leonard Wallenstein was awarded the Dr. A. Bradley Gaither Memorial Prize of $25. Certificates of honor were awarded to Francis J. McLaughlin, William H. Leitch, Leland B. Stevens, Raymond M. Cunningham, Thomas S. Sexton and Ramsay B. Thomas. The commencement address was delivered by Herbert R. O'Conor, governor of Maryland.

Annual Dinner at Jefferson

The annual dinner of Jefferson Medical College of Philadelphia was held June 1, 1939, at the Bellevue Stratford Hotel with 500 alumni in attendance. Dr. Henry K. Mohler, dean, presided. The speakers were: Mr. Robert P. Hooper, Philadelphia, president of the board of trustees; Dr. Randle C. Rosenberger, professor of preventive medicine and bacteriology, Jefferson Medical College of Philadelphia, representing the class of 1894; Dr. David B. Allman, Atlantic City, N. J., representing the class of 1914; Dr. Jean-Louis E. Brindamour, San Francisco, representing the class of 1924; Dr. Albert J. Winebrake, Scranton, Pa., representing the class of 1899; Dr. Edmund L. Jones, Wheeling, W. Va., representing the class of 1919; Dr. John W. Gahan, Medford, Mass., representing the class of 1929, and Dr. Paul A. Kennedy, Philadelphia, representing the class of 1939.

Scholarships at Baylor University

Baylor University College of Medicine, Dallas, Texas, has a limited number of scholarships and loan funds for the purpose of encouraging and aiding medical students. The Round-Up Publications Board of the University has established a loan fund consisting now of about $3,000 from which limited loans may be made to senior students. The national fraternity for medical women, Alpha Epsilon Iota, has a loan fund contributed by its members for the purpose of assisting women medical students in advanced classes. Information about this fund can be obtained from the local chapter president. The income from the Dr. J. H. McCorkle Memorial Scholarship Fund is given each year to some medical student designated by the college authorities and the donor. The income from the A. P. Cary Scholarship Fund of $2,500, held in trust, is given each year to some medical student designated by the president of the university. The total amount of tuition and fees for the first year at Baylor University College of Medicine is $414. This sum, of course, does not include board, room, clothing, transportation and the like.

Prize Winners at Western Reserve University

Jacob B. Tuckerman, son of Dr. Jacob E. Tuckerman, was a double prize winner in the recent commencement awards of the medical school of Western Reserve University, Cleveland. To him were awarded the senior prize in surgery, the gift of Dr. Elliott C. Cutler, Boston, and the senior prize in obstetrics, gift of the late Dr. Edwin C. Garvin, Cleveland. Roswell Wenner Machamer was awarded the Dr. Herbert S. Steuer Memorial Prize for special work in anatomy.

Student Officers at Louisiana

Taliaferro H. Gaharan, Jena, La., has been elected president of the student council of the Louisiana State University School of Medicine, New Orleans, for the current year; Marion J. LeDoux, New Orleans, vice-president, and James M. Pomeroy, Bastrop, La., secretary and treasurer. William R. Hargrove, Oakdale, La., was elected president of the class of 1940; Burdette E. Trichel, Harrisonburg, La., president of the class of 1941, and Keith A. Stratford, Ogden, Utah, president of the class of 1942. Leslie L. Parker, Opelousas, La., was made president of the interfraternity council and Spurgeon M. Wingo, New Orleans, editor of the *Tiger*, the student weekly publication.

Northwestern's New Dormitory for Students

Northwestern University has under construction at Huron Street and the Lake Shore Drive in Chicago a new eighteen story building which will be used exclusively as a dormitory for medical, dental and

Eighteen story dormitory of Northwestern University.

law students. The dormitory will have on each residential floor single and double rooms to accommodate sixty students, while the entire structure will accommodate 700 students. There will also be in the building libraries, dining rooms, lounges, exercise facilities, shops and a roof garden. The rentals will average around $180 a semester. The building, in modified Gothic style, will be built of Indiana limestone, to conform with the seven other buildings on the Chicago campus of Northwestern University. Two thirds of the rooms in the new dormitory will have a view across Lake Michigan. A bathing beach will be available just across Lake Shore Drive.

Annual Award at Wayne University

Dr. Jacob A. Sill, 1939 graduate of Wayne University College of Medicine, Detroit, received the annual award of $50 for the best general rating during the four year course at the school. The award was made at the annual dinner of the graduating students, faculty and alumni June 15, on which occasion Major General Merritte W. Ireland, formerly surgeon general, U. S.

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Army, gave the principal address. Dr. Ireland graduated from this school in 1890 when it was known as the Detroit College of Medicine and Surgery. At the speaker's table was a member of the graduating class who represented the student body.

Scholarships at the University of California

Following are some of the scholarships and prizes open to students at the University of California Medical School, Berkeley:

The Base Hospital No. 30 Scholarship of about $300 a year, is the income on the balance of a fund collected for the University of California Medical School Hospital Unit. No. 30.

The George Frederick Reinhardt Memorial Fund—Class of 1915—Scholarship, yields about $190 in the year 1939-1940. Preference is given to a candidate who is the son or daughter of a member of the Class of 1915 of the University of California.

The Sheffield Sanborn Scholarship, of about $200 a year, is open to medical students who need financial help to finish their training.

The Allen D. Wilson Memorial Scholarship, amounts to about $110 a year.

Scholarships are awarded only to students who are enrolled in the school at the time of application. Applicants for admission to the first year class may apply for undergraduate scholarships to the Dean of Undergraduates, California Hall, University of California, Berkeley.

THE WOODWARD PRIZES

The three Guy K. Woodward Prizes (first $150, second $50 and third $25) are offered to students in the third and fourth years of the medical curriculum who present manuscripts showing original thought in the field of internal medicine. Manuscripts offered in competition for the prizes must be in the hands of the professor of medicine before June 1 of the senior year.

Estimated Expenses at Columbia University

Following is an itemized estimate of expenses of attendance at Columbia University College of Physicians and Surgeons, New York, for a full academic year, according to the latest available announcement of the college:

	Average	Minimum
Tuition and fees	$530	$530
Room	235	172
Board	324	216
Books	70	40
Laboratory charges—first year	15	15
Laundry	40	28
Additional expenses, including clothing travel, charity, organizations and sundries	250	150
Total	$1,464	$1,151

Aid for Students at Columbia University

Columbia University College of Physicians and Surgeons, New York, has funds available in limited amount to loan to worthy students to assist in their medical studies. Applications should be filed for the spring season by January 15. Columbia University also has available many scholarships and fellowships which have been named after the donor and which are available to aid medical students in research, investigations or postgraduate study in limited amounts. Scholarships are usually awarded only to students who have high academic records and promise. Last year ninety-seven scholarships were awarded. The applications must be made in each year for which a scholarship is desired. Scholars are required to pay the balance of their tuition fees and all other fees.

Columbia University College of Physicians and Surgeons has available also a number of prizes which are awarded under specified conditions. For example, the annual income of a gift of $5,000, a fund known as the Dr. William Perry Watson Foundation in Pediatrics, is given in cash annually to that member of the graduating class showing the most efficient work during the course at the college in the study of diseases of infants and children. The Dr. Harold Lee Meierhof Prize, the income of a fund of $1,000, is available for award by the professor of pathology to the student who he considers has done the best work in that field for the current year.

Conference of Student Societies

The third annual conference of representatives of medical student societies was held in Leeds, England, July 11-14. The general subject for discussion was the prospect for the newly qualified doctor, which was dealt with under five heads: general practice, consultative practice, public health, federal services and research.

Loan Funds at Boston University

Boston University School of Medicine has certain loan funds to be used for the purpose of aiding worthy medical students. There is the Edward E. Allen Fund, the George Russell Fund and the Fenno Tudor Fund, the last established especially to aid women medical students. The university also administers certain scholarship funds which have been named after the donor and are available and awarded annually to students of advanced standing whose industry, ability and need justify the committee making the awards. First year students, except under special circumstances, are not expected to apply for aid. Applications for scholarship aid should be made to the office of the dean of the medical school prior to October 1.

Scholarships at the University of Colorado

Some of the scholarships and prizes available to students of the University of Colorado School of Medicine, Denver, are as follows:

Undergraduate Scholarships. Holders of University of Colorado Junior-Senior Scholarships who enter the school of medicine for their fourth year will be granted a remission of tuition to the extent of $22 a quarter during their first year in the school of medicine provided they ranked in the upper 25 per cent of the junior class.

The Edward G. Stoiber Scholarship. The Stoiber Scholarship Fund consists of the principal sum of $2,000 held in trust, the income of which is given each year to some student in the school of medicine designated by the donor or by the officers of the school.

Chester H. Elliott Memorial Prize in Pathology. The annual income from a fund yielding about $30 a year is awarded to the fully matriculated medical student showing the greatest proficiency in the second year courses in pathology.

Alpha Omega Alpha Prize in Anatomy. The local chapter of this honorary fraternity offers an annual prize of $25 to the medical student showing the highest scholarship and efficiency in gross and microscopic anatomy courses.

Dr. James C. Todd Prize in Clinical Pathology. The Colorado Society of Clinical Pathologists offers a money prize each year to be awarded to the student who shows the greatest proficiency in laboratory work in clinical pathology.

Carbon Gillaspie, M.D., Memorial Prize in Applied Anatomy. The prize of about $25 a year will be awarded, on recommendation of the head of the department of anatomy, to the medical student showing exceptional scholarship and technical skill in the course of applied anatomy.

Wisconsin State Board Questions

The following questions in physical diagnosis were given at the examination held in Milwaukee, June 27-30, 1939, by the Wisconsin State Board of Medical Examiners: (Answer three)

1. What physical signs may be expected in cirrhosis of the liver?
2. What symptoms and physical signs would warrant the diagnosis of complete heart block?
3. What physical signs may be present in aneurysm of the arch of the aorta?
4. Given a patient with frank lobar pneumonia, what change in symptoms and physical signs would indicate the development of empyema?